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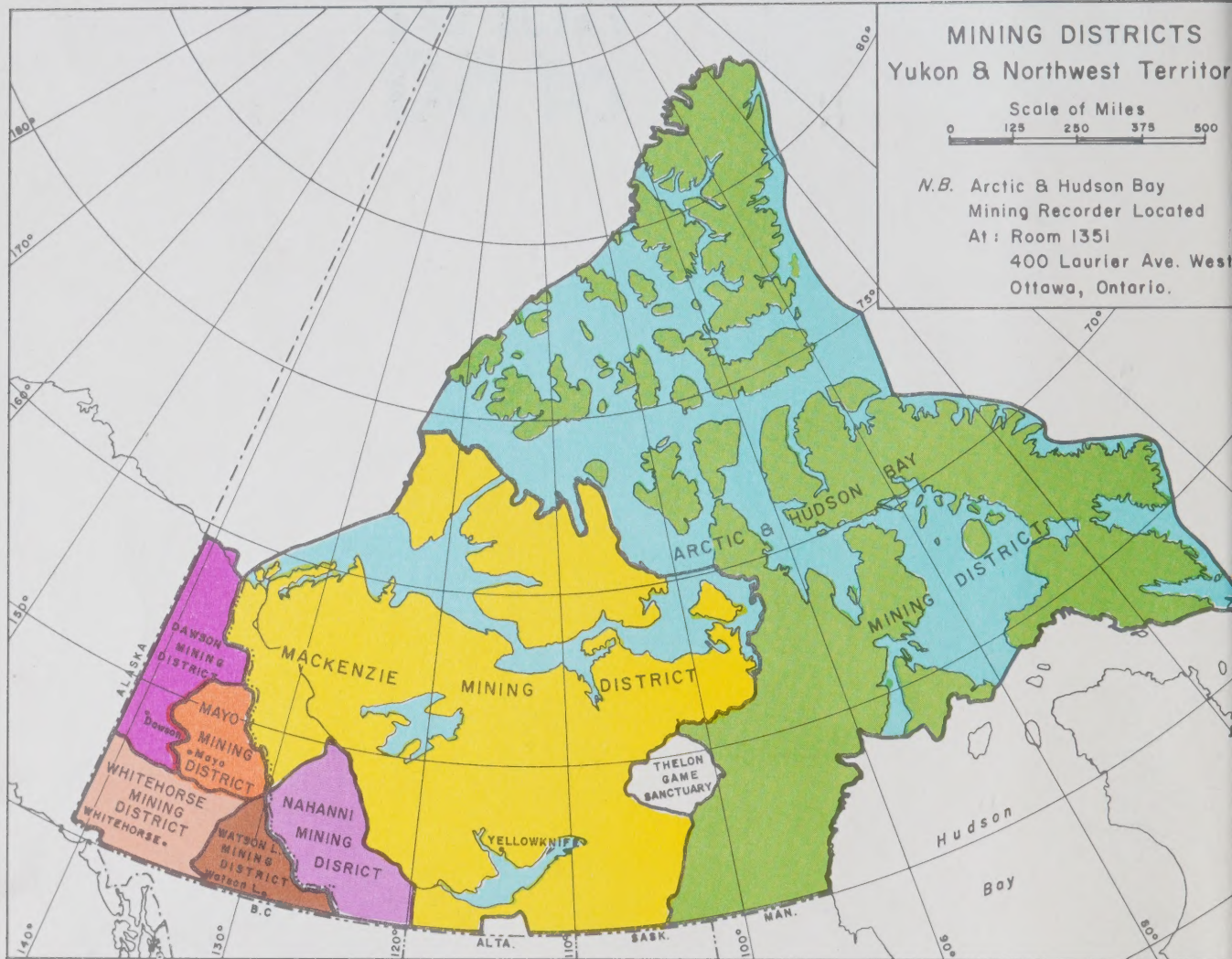


*thern Natural Resources and Environment
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northern economic
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MINING DISTRICTS Yukon & Northwest Territories

Scale of Miles
0 125 250 375 500

N.B. Arctic & Hudson Bay
Mining Recorder Located
At: Room 1351
400 Laurier Ave. West
Ottawa, Ontario.

MINES & MINERALS NORTH OF 60°

MINING ACTIVITY IN THE YUKON AND THE NORTHWEST TERRITORIES

An annual publication issued under the authority of the Honourable
Jean Chrétien, P.C., M.P., B.A., LL.L. Minister of Indian Affairs and
Northern Development.

Northern Economic Development Branch. Department of Indian
Affairs and Northern Development — Ottawa

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Introduction

Mining activity in the Yukon and the Northwest Territories was highlighted by the recording of 52,000 mineral claims, an increase of 17,000 or 48 per cent over the previous year.

The year continued a period of rapid expansion in the mining industry north of the 60th parallel which can be traced back to the year 1964 when only 6,000 claims were recorded (graph page 27). Four major staking rushes have occurred since that date. Pine Point in 1965 and 1966 resulting in 27,000 claims recorded; Ross River in 1965—10,000 claims; Coppermine River in 1967 and 1968—39,000 claims; Artillery Lake in 1968—8,500 claims.

The shipment of high-grade lead-zinc ore from Pine Point Mines in November of 1964 over the newly constructed Great Slave Lake Railway marked the beginning of a tremendous forward surge that has highlighted mining development in the Northwest Territories and the Yukon in the four years since. Until 1964, the small mineral economy of that part of Canada that lies north of the 60th Parallel had been based largely on the production of gold and silver, with smaller amounts of lead, zinc and cadmium associated with silver in the Yukon. Dredging and other placer operations were being carried on in the Dawson area of the Yukon and several gold mines were operating in the Yellowknife area of the Northwest Territories. The Eldorado mine on Great Bear

Lake, famous for its production of uranium, used in the Manhattan Project in World War II, was the first viable mining operation in the Northwest Territories. It came into production as a radium and silver mine in 1933.

The value of mineral production in the years immediately prior to 1964 ranged from 30 to 35 million dollars with each Territory producing about half of this total. Since 1964, the value of mineral production in the Northwest Territories increased more than six fold, and lead and zinc replaced gold and silver as the leading metals. In 1968, two open-pit operations—one copper and one asbestos—began operations in the Yukon Territory. In addition, two small gold-silver mines came into production during the year. Thus the total wealth of mineral production in the two Territories is now more than \$150,000,000.

The year 1969 promises the development of new mines and further increases in the value of mineral production. In the Northwest Territories, the Pine Point lead-zinc operation will expand its milling rate by 60 per cent; a silver property has announced production plans and a second silver-lead property will continue with underground exploration and development work. In the Yukon a large lead-zinc open-pit operation and a gold-silver property are scheduled to begin production.



Coppermine River Ltd. Exploration Camp on Hope Lake in the Coppermine River Area.
Photo by National Film Board

NORTHWEST TERRITORIES

PRODUCING MINES

Mineral production in the Northwest Territories reached an all time high with an estimated value of \$121,317,062 exclusive of tungsten production for which figures are not available. Lead and zinc continue to be the leading metals accounting for 79 per cent of the total value. No new mines came into production during the year. One gold mine announced closure of its property at the end of 1968 with the depletion of economic ore reserves.

Lead-Zinc

Pine Point Mines

Location	South shore of Great Slave Lake
Product	lead-zinc
Rate	8,000 tons daily
Grade	9.4% combined lead-zinc
Reserves	40,500,000 tons
Employees	328

Pine Point Mines completed construction of a 3,000 ton a day addition to its concentrator at an estimated cost of 16.5 million dollars. This addition increases the milling capacity to 8,000 tons per day and is scheduled to be in operation in January of 1969. Pine Point depleted its deposits of high-grade direct-shipping ore in December of 1968. The increase in milling tonnage of lower grade ores will enable the Company to maintain its total mineral production.

Gold

There were five gold mines in production during the year producing an estimated \$13,085,822 in gold, \$1,270,654 less than in the previous year. This decrease was due mainly to the loss of one gold producer during the year.

Giant Yellowknife Gold Mines

Location	1.5 miles north of Yellowknife
Product	gold
Rate	800 tons per day
Grade	0.71 ounces per ton
Reserves	1,682,500 tons
Employees	350

Supercrest Mines Ltd.

Location	1.5 miles north of Yellowknife and adjoining Giant
Product	gold
Rate	100 tons per day
Grade	0.71 ounces per ton
Reserves	260,000 tons
Employees	operated by Giant

Lolor Mines Ltd.

Location	1.5 miles north of Yellowknife adjoining Giant
Product	gold
Grade	0.67 ounces per ton
Rate	100 tons per day
Reserves	324,000 tons
Employees	operated by Giant

Supercrest is owned 50 per cent by Giant Yellowknife and 50 per cent by Akaitcho. Lolor is owned 87½ per cent by Giant Yellowknife, 12½ per cent by Conwest Exploration. Both Lolor and Supercrest Mines adjoin the Giant Yellowknife Mines and the ore bodies are being developed by Giant Yellowknife from its existing workings. Ore from each of these mines is processed at the Giant Yellowknife mill which has a rated capacity of 1,000 tons per day.

In addition, Giant Yellowknife is continuing exploratory work on other gold showings in the Yellowknife gold belt including the Northbelt Mines' property immediately north of Supercrest.

Con-Rycon-Vol. Mines Ltd.

Location	1.5 miles south of Yellowknife
Product	gold
Rate	525 tons per day
Grade	0.71 ounces gold per ton
Reserves	not available
Number of Employees . .	225

This property is operated by Cominco Ltd. Development work is being conducted on the 4700 foot level in preparation for stoping. A long drift being driven south to the Yellorex property on the 2300 foot level has now advanced about 2 miles from the Con C-1 shaft. The Company is planning to establish three new levels below the 4900 foot level by shaft sinking.

Discovery Mines Ltd.

Location	50 miles north of Yellowknife
Product	gold
Rate	225 tons per day
Grade	0.48 ounces per ton
Reserves	nil (production ending in 1969)
Employees	80



Helicopters are used extensively in early exploratory programs on mineral claims in the Northwest Territories.
Photo by National Film Board

Discovery Mines Ltd. has announced that production will cease at this property early in 1969. Discovery has obtained control of the Camlaren Mine, a former producer, 42 miles southeast of Discovery, on Gordon Lake but plans for this property have not been announced.

Silver-Copper

Echo Bay Mines Ltd.

Location	Great Bear Lake
Product	silver-copper
Rate	100 tons per day
Grade	70 ounces per ton silver, 2.2% copper
Reserves	not available
Employees	87

To date, all mining has been done on three adit levels. However, the Company has completed sinking a three compartment shaft to a depth of 500 feet below the third level adit. Underground exploration and development is currently being conducted on the lower levels. Echo Bay is rated as the second highest silver producer in Canada.

Tungsten

Canada Tungsten Mining Corporation

Location	125 miles north of Watson Lake, Y.T.
Product	tungsten-copper
Rate	350 tons per day (1968)
Grade	1.71% tungsten, 0.45% copper
Reserves	934,000 tons
Employees	70

Canada Tungsten resumed milling operations in December of 1967 after a year's shutdown resulting from a fire in December of 1966 which destroyed the crusher house and mill. The new mill is more compact and efficient than the one destroyed by fire, and it is expected that a better grade of concentrate will be produced. Mill capacity has been increased to 350 tons per day.

MINING DEVELOPMENT

Lead-Zinc

Newconex Holding Ltd., a Toronto based holding and investment company, is studying the possibility of bringing into production the lead-zinc property of Buffalo River Exploration Limited located in the Pine Point area. The property contains a lead-zinc ore body with ore reserves reported at 1,400,000 tons grading 13% combined lead-zinc.

Silver-Copper

Terra Mining and Exploration has announced plans to bring its silver-copper property, in the Camsell River area, into production during 1969. The mine is located 30 miles south of Port Radium on Great Bear Lake. In 1968, Terra completed 2000 feet of inclined shaft and lateral development and plans to ship in construction supplies and equipment to the mine early in 1969.

EXPLORATION

The Northwest Territories is experiencing one of the most active prospecting periods in its history. The exploration activity can be gauged by the fact that 44,489 claims were recorded in the Territories in 1968 as compared to 28,622 claims in 1967.

Many mining exploration companies carried out major exploration programs in the Coppermine River area and it is estimated that over \$4,000,000 has been expended on these programs. Current interests are in sulphur in the Arctic Islands, nickel east of Artillery Lake, copper in Victoria Island, silver in the Camsell River and Bathurst areas, lead-zinc in the Pine Point area, silver-lead in the Nahanni Mining District, iron ore in Baffin Island and Melville Peninsula and uranium in the Keewatin Mining District.

Copper

Coppermine River Limited led the way in mineral exploration in the Coppermine River area. This company carried out an \$800,000 program in 1968 and has reported finding new drill targets as a result of the season's work. Surface prospecting, mapping and a combination of geophysical surveys were carried out in addition to diamond drilling. The company has proven an additional tonnage in the 47 zone and reserves are now reported at 4,000,000 tons grading 3% copper.

Bernack Coppermine Exploration Ltd. made a significant copper discovery on one of its properties in the eastern portion of the Coppermine River area. Diamond drilling indicated a well-mineralized zone on a north trending linear structure and, late in the season, two more locations were indicated along the southerly projection of the structure. Bernack is being financed by Frobex, Conwest, Rayrock, and Consolidated Canadian Faraday.

Rose Pass Mines Ltd. completed a 20 mile induced polarization survey over its property. Geological mapping, trenching and diamond drilling were carried out on showings and anomalies found by prospecting and geophysical survey. This work has revealed promising showings of copper mineralization in two zones. The company plans to continue drilling in 1969.

Hearne Coppermine Exploration Limited holds 8 claim groups totalling 2,867 claims situated in the Coppermine River area. During 1968, the company carried out an intensive exploration program which involved a combined application of exploration techniques in an attempt to overcome the limitations of the short Arctic operating season. The program consisted of prospecting, geological mapping, trenching and diamond drilling. A number of targets have been selected that warrant further work in 1969.

Chance Mining and Exploration Co., financed by Conwest Exploration Co. Ltd., and Central Patricia Gold Mines Ltd., carried out a drilling program on its 200 claim group. The company has announced plans to continue in 1969.

East Coppermine Exploration also under Conwest management conducted a drilling program on targets on a 1,500 claim group. The company has announced plans to continue in 1969.

The companies operating in the Coppermine area experienced a number of difficulties in prospecting and evaluating the many properties as the area is large and isolated. The companies have found many mineral showings but the deposits vary as to type, size and grade. The development of mineral deposits will depend not only on the value of the mineral deposits themselves, but also to a large degree on the costs of the transportation that can be provided for shipping copper concentrates or high-grade direct-shipping copper ore to world markets.

In spite of the lack of a major new mineral find, the 1968 work in the Coppermine River Area furthered evaluation of the mineral potential.

Co-operative action resulted in a large scale airborne geophysical survey over mineral claims held by some 40 mining companies in the Coppermine area. The survey was conducted jointly by Hunttec Limited and Lockwood Survey Corporation Limited of Toronto, Ontario.

The following list includes many of the Companies carrying out programs in the Coppermine area during 1968:

Clero Mines Ltd.; Conwest Exploration Co. Ltd.; East Coppermine Exploration; Canadian Goldale Mining Corp.; Canadian Lencourt Mines; Northville Explorations; Earlecrest Resources Ltd.; Agassiz Mines Ltd.; General Resources Ltd.; Lake Beaverhouse Mining Ltd.; Nordic Exploration; James Bay Mining Corp.; Bracemac Mines Ltd.; Croydon Mines; Madrona Explorations Co. Ltd.; Armore Mines Ltd.; P.C.E. Explorations; United Buffadison Mines Ltd.; Quadrate Explorations Ltd.; New Cronin Babine Mines Ltd.; Canadore Mining & Development Corp.; Rose Pass Mines;

Komo Explorations; Adera Mining; Hunttec Ltd.; Teshierpi Mines; Willow Lake Mines Ltd.; Ramid Resources Ltd.; Coronation Gulf Mines Ltd.; Janus Exploration; Hearne Coppermine Ltd.; Magnum Consolidated Mining Co.; Continental McKinney; Univex Mining Corp. Ltd.; Territories Copper Mines; Torwest Mines Ltd.; Rodstrom Yellowknife; Continental Potash Corp.; Spectroair; Homestake Silver Mines Ltd.; United Keno Explorations; Casino Silver Mines Ltd.; Columbia Placers Ltd.; N.W.T. Coppermine Ltd.; and Tower Mines Ltd.

In other parts of the Territories, the search for copper continued with known occurrences being examined and new discoveries made.

Muskox Syndicate discovered numerous copper occurrences during an exploration program on the northwestern sector of Victoria Island. The program, supported by helicopter, consisted of basic prospecting and geological mapping covering 1,000,000 acres held under Prospecting Permits issued under authority of the Canada Mining Regulations. During the season, 2000 claims were staked. Participants in the Syndicate include Spooner Mines and Oils; Silvermaque Mining; Siscoe Mines; T.C. Explorations; Magnum Consolidated Mining; Hearne Coppermine Explorations; and P.C.E. Explorations.



Geologist examining drill core at a drill site. Photo by Coppermine River area, N.W.T. National Film Board

Grandroy Mines carried out a helicopter-supported prospecting program on 1200 claims in the Northwestern sector of Victoria Island. The company reports that it has found encouraging showings of high-grade native copper and chalcocite. First Orenada Mines; Captain Mines; Satellite Metal Mines; and Combined Metals hold interests in most of the claim groups.

Polaris Mines completed a drilling program on its "Gib" copper prospect in the east arm of Great Slave Lake, N.W.T.

Anaconda Petroleum carried out an exploration program on a property held under option in the McLaren Lake area northeast of Great Bear Lake.

Mariner Mines Ltd. commenced diamond drilling on a copper prospect on the east shore of Great Bear Lake. The drilling program was started late in 1968 following the success of a surface exploration program earlier in the year which included prospecting, trenching, and some diamond drilling. The claims cover showings of chalcopyrite and chalcocite originally found in the 1930's.

Mogar Mines conducted a program of surface prospecting, mapping and line cutting for a geophysical survey, east of the Mariner Mines property.

Trans-Canada Oils. This company carried out a surface prospecting and mapping program at the north end of the Sloan River and Hunter Bay on Great Bear Lake. A radiometric survey of the Bellener Lake claim group east of Great Bear Lake was also conducted.

Flagstone Mines, Arlington Silver Mines and Larago Mines conducted a primary exploration program on claims

covering a basalt formation called the Coppermine River Group. The claims are in the Bathurst Inlet area and cover a number of copper showings. The program consisted of prospecting, geological surveys and mapping, geochemical and geophysical surveys.

Shirex Exploration Limited conducted a reconnaissance program consisting of geochemical soil sampling on claims in the Echo Bay area of Great Bear Lake. The claims cover copper occurrences.

Channel Copper Mines Ltd., carried out a bulldozer trenching program on its claims in the east arm of Great Slave Lake. The claims cover a number of copper showings that had previously been hand-trenched.

Bathurst Inlet Mining Corp. carried out a primary surface prospecting program on mineral claims covering copper mineralized gossan zones on the Hackett River, 300 miles northeast of Yellowknife, N.W.T.

Nor-Can Minerals Ltd., carried out geophysical airborne and ground surveys on copper prospects at Cherbun Bay on the south shore of Great Slave Lake. The program outlined several anomalies which have been trenching revealing copper mineralization.

Lead-Zinc

Yellowknife Base Metals, a wholly-owned subsidiary of Consolidated Manitoba Mines, continued a drilling program on the Company's lead-zinc property in the Pine Point area. The drilling started in September and a mineralized zone has been encountered in the southeast corner of the group.



Tent Camp (Exploration) in the Barren Lands, Northwest Territories.

Photo by National Film Board



Helicopter coming in for a landing at an exploration camp at night in the land of the Midnight Sun. Photo by National Film Board
Coppermine River Area, N.W.T.

Territory Mining Ltd., carried out a diamond drilling program on its property in the Pine Point area; 1300 feet of drilling was completed.

Payfair Mines Limited plans to conduct a reconnaissance gravity survey on its property in the Pine Point area.

Iskut Silver Mines Limited carried out a short drilling program on a property in the Nyarling River area.

Galena Holdings Limited completed a drilling program on its claims, at Galena Point in the Bathurst Inlet area of the N.W.T. Seven holes were drilled and a total of 757 feet of drilling was completed.

Ramid Resources Limited completed a prospecting and geological mapping program on a lead-zinc showing on a property consisting of 732 mineral claims in the Flat River area of the Nahanni Mining District. The property is located 28 air miles south of Canada Tungsten.

Silver

Silver Bay Mines Limited, moved in equipment and supplies and set up a camp from which to do underground exploration in the Camsell River area. The main program consisted of rehabilitation of the old White Eagle Mine and work included additional drifting, raising and sampling in an effort to delineate ore zones.

Caesar Silver Mines Ltd., completed 19 diamond drill holes amounting to 3,500 feet of drilling on a 26 claim property located on the south side of the Camsell River opposite the camp of Silver Bay Mines Ltd. The drilling has

been successful and it is expected that follow-up work will continue.

Jason Explorers carried out a primary surface prospecting program on claims located about a mile west of the Silver Bay Property.

King Resources and Slave Point Mines carried out exploration surveys near Rainey Lake in the Camsell River area.

Hope Bay Syndicate financed by Lynx-Canada Exploration Ltd., O'Brien Exploration Limited and Mr. Robert W. Nicholls carried out a surface prospecting program in the Hope Bay area. The program also included geochemical surveys, geophysical surveys and diamond drilling on showings previously located. Several properties involving 400 claims were investigated.

Brenda Mines carried out a limited exploration program in this area south of Hope Bay Syndicate's properties.

Gold

Discovery Mines Limited carried out a geological survey and mapping program on claims in the Indin Lake area. The property is a large low grade gold deposit first discovered shortly after World War II.

Selco Northern Limited holds a Prospecting Permit in the Keewatin Mining District of the Northwest Territories. A prospecting crew consisting of three parties covered the area of the Permit. The Company also did geological mapping, geophysical and geochemical surveys, and diamond drilling on a gold showing at Eric Lake in the general area of the Permit.

Uranium

Hogan Mines Ltd. carried out a scintillometer survey and staked claims near the Beaver River area south of Great Slave Lake. Trenching was also done on the exposed zones.

Eastern Mackenzie Syndicate carried out an exploration program for uranium in the Ellice River area. Initial work covering an area held under several Prospecting Permits consisted of an airborne spectrometer survey with follow-up work on favourable zones by prospectors on the ground. Locations of interest were trenched, mapped and sampled.

Exploratory work was done on claims held by *Hanna Gold Mines Ltd.* and *Midland Nickel Corp. Ltd.*

Iron

N.H. Ursel Associates investigated iron formations covered by two Prospecting Permits on the Melville Peninsula. A large magnetic anomaly shown on the aeromagnetic series of maps published by the G.S.C. for Baffin Island was staked late in 1968 by other interests.

Silver-Lead

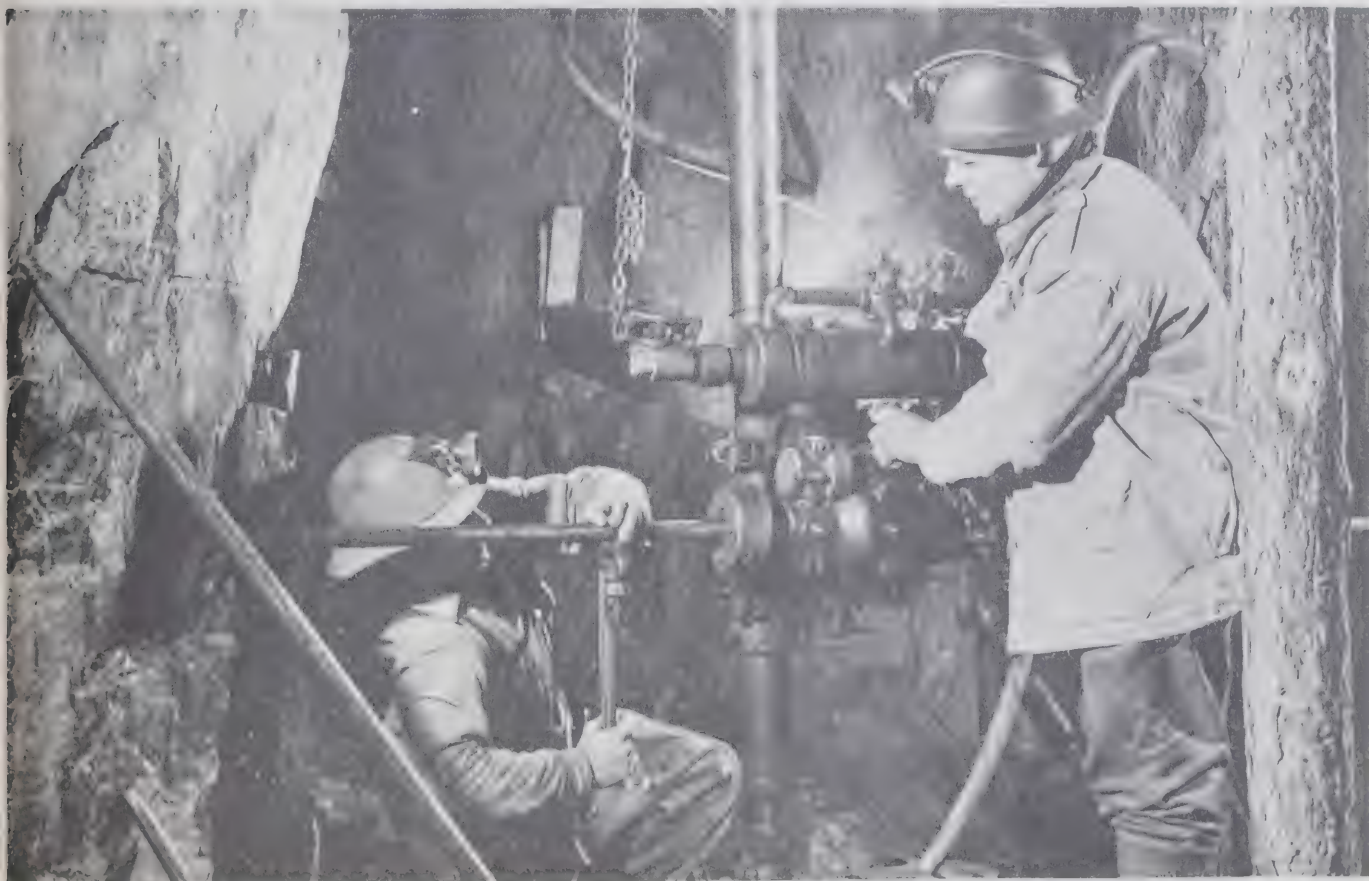
Cadillac Explorations Ltd. continued its exploration program on silver-lead-zinc prospects in the Prairie Creek area

of the Nahanni Mining District. The company's program includes surface drilling, bulldozer trenching and underground exploration.

Nickel

What appears to be a new nickel mineralized area is presently being explored by *Newmont Mining Corporation*. A prospecting program in 1968 in the Artillery Lake area 250 miles east of Yellowknife resulted in the Company staking 800 claims. Newmont has reported its findings as minor indications of nickel and definitely no ore at this stage. Other mining exploration companies and speculators are staking ground in the area, and to the end of 1968, over 8,000 claims had been recorded.

Newmont became interested in the area following publication of maps of an aeromagnetic survey covering the region. These maps show a number of magnetic anomalies that appear to be associated with the occurrence of ultrabasic rocks in the area. At this early stage, there are indications that the geology may be similar to that of the Thompson-Manitoba Nickel Belt. It will take considerably more time and work to confirm this comparison.



Underground diamond drilling in a Northern Gold Mine.

Photo by National Film Board

YUKON TERRITORY

PRODUCING MINES

The mineral production of the Yukon was valued at \$23,496,328 for 1968. This is an increase of nearly \$8½ million over the 1967 value. Two new small underground gold-silver mines came into production and silver lead-zinc continues to be mined by underground methods in the Mayo Mining District. The increase in mineral value came principally from the two open-pit mines, one producing copper and the other asbestos. Small placer gold operations continue on a number of creeks throughout the Territory.

Gold

Gold production in 1968 came from 30-40 small placer operations in the Dawson, Mayo and Whitehorse Mining Districts. Gold was also produced in the concentrates from New Imperial Mines Ltd., Arctic Gold and Silver Mines Ltd., and Mount Nansen Mines Ltd.

Gold-Silver

Arctic Gold and Silver Mines Ltd.

Location	8 miles south of Carcross
Product	gold, silver, lead, zinc
Rate	100 tons daily
Grade	0.52 ozs of gold and 14.4 ozs silver
Reserves	37,870 tons
Employees	61

Arctic Gold and Silver Mines Limited brought its gold-silver mine on Montana Mountain near Carcross, into production in August of 1968. This company ships its concentrates by truck to a railroad siding at Carcross and from there by rail and ship on the White Pass Route, and onward to Sweden for refining.

The Company operated its mill until December 1968 when it was temporarily closed for alterations to the milling circuit. Problems with dilution and milling have caused this company to recalculate its ore reserves. A new adit has been started below the present underground workings to develop additional ore reserves.

Mount Nansen Mines Ltd.

Location	45 miles west of Carmacks
Product	Gold, silver
Rate	55-133 tons daily
Grade	0.50 ozs. gold 18.0 ozs of silver
Reserves	330,000 tons
Employees	60

Situated north of Whitehorse, this company brought its underground mining property into production in September 1968. Initial development work has been on the Huestis vein from two adit levels. The adjoining Webber vein is being developed and interconnected with the Huestis vein. The company plans to obtain future production from the adjacent Brown-McDade property where considerable underground work had been done by the previous owners.

The concentrates produced at this operation are hauled by road to Whitehorse thence trans-shipped to Vancouver over the White Pass Route in special containers.

Silver-Lead-Zinc

United Keno Hill Mines

Location	26 miles northeast of Mayo
Product	Silver, lead, zinc, cadmium
Rate	154 tons daily (1968)
Grade	38.6 ozs. silver 7.5% lead 6.5% zinc
Reserves	100,230 tons
Employees	260

United Keno Hill Mines Ltd., continued to operate its underground mines in the Galena Hill area of the Mayo Mining District. The bulk of the ore came from the Hector-Calumet Mine. Underground exploration and development work continued at the Elsa Mine and the Husky claim on Galena Hill and at the Sadie-Ladue Mine on Keno Hill.

Water problems at the Husky shaft slowed development work at this property in September. A bulkhead was installed below the third level and ore reserves on the upper three levels will be developed at this stage.

Copper

New Imperial Mines

Location	7 miles from Whitehorse
Product	Copper
Rate	2,000 tons daily (1968)
Grade	1.15% copper
Reserves	4,590,000 tons open-pit, 5,000,000 tons underground containing 2% copper
Employees	161

New Imperial Mines Ltd., located in the Whitehorse Copper Belt about 7 miles south of the City of Whitehorse continued operating through 1968. Alterations in the mill circuit have increased recovery of copper, and the mine produced nearly 12 million pounds of copper during the year. Open-pit mining of the Little Chief orebody is nearly completed. Engineering feasibility studies were carried out to determine the possibility of mining the extension of the orebody by underground methods. Deep drilling results indicate that the ore increases in tonnage and grade at depth. The company prepared its Arctic Chief orebody for open-pit mining in 1968 and mill feed is now coming from both the Little Chief and Arctic Chief orebodies.

Copper concentrates are shipped from Whitehorse to Vancouver by the White Pass Route for trans-shipment to Japan by ocean vessels.

Asbestos

Cassiar Asbestos Corporation Ltd.

Location	50 miles northwest of Dawson
Product	asbestos fibre
Rate	2,348 tons daily (1968)
Grade	6-7% 1/16" - 1/8" fibre
Reserves	25,000,000 tons
Employees	263

The operation at Cassiar Asbestos Corporation Ltd., located at Clinton Creek 50 miles northwest of Dawson City reached its planned rate of production early in 1968. The mining is being done by open-pit method and is the most northerly open-pit operation in Canada.

A new modern townsite which is serviced by DC 3 aircraft and by road, has been established for its employees close to the mine. The asbestos fibre is shipped to Whitehorse by trucks and then trans-shipped over the White Pass Route to Vancouver.

MINE DEVELOPMENT

Lead-Zinc

Anvil Mining Corporation Ltd., continued development and construction at its property located 130 air miles northeast of Whitehorse. This lead-zinc property, one of the largest in Canada, is scheduled to begin production late in 1969.

This project involves a direct capital expenditure of \$64 million and with further provision for power facilities, townsite, roads, and expanded rail and shiploading facilities, it is estimated that the Anvil project will result in direct and indirect expenditures totalling \$100 million.

Anvil will sell its production of lead and zinc concentrates to two Japanese companies, under an eight year agreement. The 368,400 short tons of concentrates to be produced annually will go to Toho Zinc Co., Ltd., and Mitsui Mining and Smelting Co., Ltd. Concentrates will be shipped in special containers via road and railroad to the U.S. port of Skagway for trans-shipment to Japan.

The ore reserves at Anvil are estimated at 63.5 million tons averaging 3.4% lead and 5.7% zinc with just over an ounce of silver per ton. The mine will begin production at a milling rate of 5,500 tons per day increasing to 8,000 tons per day in the sixth year of production.

Gold-Silver

Venus Mines Ltd., located on Windy Arm near Arctic Gold and Silver Mines completed over 3,500 ft. of drifting and raising in its underground exploration program. The company has announced plans to bring the property into production in 1969.

An engineering feasibility study reports reserves of 138,400 tons grading 0.39 ozs. of gold and 11.6 ozs of silver. An access road has been completed from Carcross to the mine property.

EXPLORATION

The impact of current developments, including that of Anvil Mines resulting in improved transportation, communications and business stability is changing the nature of mining exploration in the Yukon. No longer are exploration companies entering the Territory for a one season effort based on finding rich high-grade deposits; they are planning longer programs and more and more companies are opening field offices in Whitehorse as a base for continuing exploration programs.

There was no single area that could be highlighted for mining exploration activity, but all areas of the Yukon were being prospected. The search for minerals was headed by detailed work on copper, silver, lead, and lead-zinc deposits with prospecting being carried out on an increasing number of tungsten showings, particularly in the eastern Yukon.

Lead-Zinc

No new deposits were reported in the Anvil-Vangorda area and the estimated available tonnage remains at 80 million tons of lead-zinc.

Kerr Addison Mines Ltd., carried out a limited diamond drilling program on its Vangorda deposit in order to obtain a bulk sample. This company also completed geophysical surveys on its Swim Lake property. No increase in the reserves of 15,000,000 tons of indicated lead-zinc ore was

reported. The grade is similar to that of Anvil's Faro orebody.

Cominco carried out a drilling program on a property near Swim Lake.

Hudson Bay Mining and Exploration conducted an extensive drilling program to check extensions of a lead-zinc deposit on its property at MacMillan Pass on the Canol Road. The company, in addition to operating 3 diamond drills, conducted prospecting and exploration programs in the area adjacent to its mineral claims. Early in the 1950's, diamond drilling indicated 9,000,000 tons of ore averaging 5-6% zinc and 0.8% lead, on the property.

Atlas Explorations Ltd., in a joint venture with Mitsui Mining and Smelting Company of Japan carried out a large diamond drill program on a zinc-lead property known as the Bay Group. The property is located in the Pelly Lake area east of Ross River. Atlas carried out primary prospecting and exploration on claims staked in the Mount Lelons area 60 miles northeast of the Anvil Mine. The property covers silver-lead and lead showings, first outlined by an exploration program carried out on favourable targets located in the 1967 season. The 1968 program included regional geochemical soil and silt sampling, geophysical surveying, surface prospecting, geological mapping and hand trenching.

Fort Reliance Minerals performed diamond drilling on its Redforth property located 40 miles northeast of Watson Lake, Y.T. The drilling was to test geophysical anomalies located near the presence of sulphide mineralization found both in place and as float. The property adjoins a property controlled by American Smelting and Refining Company Limited.

American Smelting and Refining Company Limited is reported to have carried out further diamond drilling on its 70 claim property at Quartz Lake. Diamond drilling in the 1950's indicated 1 million tons of ore averaging 5% lead and 10% zinc and 1.8 ozs. of silver.

Boswell River Mines carried out an exploratory program on the Pan group of claims located 15 miles by road from Mile Post 722 on the Alaska Highway. The program included geophysical surveys, bulldozer trenching and diamond drilling in an area where showings of lead-zinc and zinc were known to exist.

Silver-Lead

Stump Mines Ltd., holds 58 mineral claims and has an option to acquire 70% interest in an adjacent 168 claims held by Silver Key Mines. The claims cover a number of silver-lead prospects at the headwater of the Ketza River 120 miles northeast of Whitehorse. Access to the property is by a 24

mile tote road which connects with the Watson Lake — Ross River development road 11 miles east of Ross River. Silver-lead mineralization was first reported in the Ketza River area in the late 1940's by prospectors working for Hudson's Bay Mining and Smelting Company Ltd. A high grade discovery in 1954 attracted Conwest Exploration Co., Ltd. to the area. From 1954 to 1957, Conwest did exploration work including the driving of 3 short adits on three separate silver-lead showings. The property was dropped by Conwest in 1957 and optioned to the Ketza Key Silver Mines Ltd., who built a tote road and did some surface stripping. In 1964, Silver Key Mines Ltd., acquired the property and carried out an exploration program from 1964 to 1967. The program consisted of prospecting, bulldozer stripping, trenching, diamond drilling, and geochemical surveys. Stump Mines acquired property adjoining Silver Key and in 1966 carried out a soil sampling program. A number of soil anomalies were found and bulldozer trenching located a mineralized vein that was diamond drilled in 1967.

In 1968, Stump Mines completed an adit on the vein and did some underground diamond drilling. Further soil sampling studies revealed more anomalies which were opened up by bulldozer trenching. After the first adit was completed, 2 more adits were started on high grade silver prospects.

Connaught Mines Ltd., formerly known as the Sixty Mile Mining Company continued bulldozer trenching on its Mosquito Creek silver-lead property. This property contains a number of massive galena veins, two of which were high graded in a limited way (25 tons) in 1966. The Company commenced a diamond drilling program in the fall of 1968. The prospect was staked by a Prospector named Chefkoi in 1965 to cover float and geochemical anomalies. The original showings were first reported in the early 1900's.

Silver Spring Mines Ltd., carried out soil sampling and electro magnetic surveys, trenching and mapping on claims near Hansen Lakes. On its Mount Haldane property, 8-9 miles of Tote Road have been built and considerable trenching completed to date.

Fort George Mining and Exploration Ltd., carried out bulldozing, stripping, and trenching on the "MO" claim groups on Sourdough Hill. Two small shafts have been sunk on the "Mining" claim. This work indicates that there are two veins on the property which carry disseminated galena. The Company is also carrying out work on Veavette Hill, located 33 miles northeast of Mayo.

Tintina Silver Mines holds 108 claims covering a silver-lead prospect 100 miles/northwest of Watson Lake. The property was found in 1961 and surface exploration, stripping, trenching, underground development, and diamond drilling

was carried out in 1962. The results of that work were disappointing and no further work was done until this year when a soil sampling study was carried out.

Matt Berry Mines commenced drilling a 32 claim property on the east arm of Francis Lake. The drilling is to test anomalies indicated by geophysical and geochemical surveys carried out earlier in 1968. Earlier drilling on the property indicated values in silver-lead and zinc.

Manardi Metals Mines has reported significant results from a drilling program on a silver-lead-zinc property 125 miles north of Watson Lake.

Copper

Silver City Mines Limited controls 186 mineral claims 16 miles southwest of Mile 1167 Alaska Highway. The property is optioned by United Pemetex which is jointly owned by Silver City and Central-Del Rio Oils Ltd. The showing is an old native copper discovery on the Upper White River Canyon discovered in 1905. In 1967, bulldozer trenching and sampling was carried out; this was followed by geophysical surveying and diamond drilling in 1968. It is reported that Central-Del Rio Oils Ltd., did not elect to exercise its option on the property.

Modern Exploration Ltd., constructed a 50-mile tote road from Mile 75 on the Wind River Road to its Bonnet Plume property, where an airstrip was constructed to assist in prospecting a copper-silver showing.

New Imperial Mines continued a program of exploration over its claim groups on the Whitehorse Copper Belt. Surface diamond drilling and geophysical surveys indicated increased grades and additional tonnages as the copper mineralization is tested at depth. The drilling was carried out on the War Eagle mineral claim to the north of the Belt, the Best Chance claim and on the Cowley Park claims.

Yukon Revenue Mines, a private company is working on a porphyry copper prospect 50 miles northwest of Carmacks. Bulldozer trenching has revealed a copper mineralized zone containing two high-grade lenses.

Cyprus Exploration Corporation Ltd. did bulldozer trenching on copper mineralization at the south end of Fairchild Lake, 124 miles northeast of Mayo.

McIntyre Porcupine Mines Ltd., carried out a limited diamond drilling program on a copper prospect held by Glenlyon Mines. The property is 48 miles downstream from Anvil on the Pelly River.

Hart River Mines Ltd., completed 5,400 feet of diamond drilling, mapped the regional geology and complemented the drilling by additional soil sampling. Magnetic and electro-magnetic surveys have been done and a second drill has been taken to the property. The claims are located 80 miles

northeast of Dawson, Yukon Territory. Mineralization consists of irregular banded pyrrhotite and pyrite carrying mainly chalcopyrite, sphalerite, and minor amounts of galena. This company plans to spend \$500,000 on a new phase of the program. The plans include 2,000 feet of underground drifting on three adit levels, construction of a winter road from the Dempster Highway and an additional 15,000 feet of diamond drilling. The deposit was located in 1966 and hand trenching was carried out at that time. In 1967, soil sampling and geophysical surveys and a limited amount of drilling was performed.

Northern Empire Mines Ltd., 20 miles north of Anvil, carried out a bulldozer trenching program and found copper-zinc mineralization.

Copper-Nickel

Hudson Bay Mining and Smelting carried out a surface exploration program for its subsidiary company "Hudson-Yukon Mining Co., Ltd.," on a 91 claim group at Quill Creek 7 miles west of Mile 1111, Alaska Highway. This nickel-copper showing was found in 1952. During the period 1952 to 1956, Hudson Bay Mining and Smelting Company Limited optioned the claims and carried out an extensive surface and underground exploration program. At the end of 1956, indicated reserves were estimated to be 737,600 tons averaging 2.04% nickel, 1.42% copper, 0.00502 ozs. gold, 0.038 ozs. platinum, 0.027 ozs. palladium, and 0.073% cobalt. The work to that date consisted of 14,000 feet of underground drifting, raising and sinking. In addition, about 65,000 feet of surface and underground diamond drilling was carried out.

Discovery Mines carried out an underground drilling program on the "Micro" group of mineral claims covering a copper-nickel prospect 2.8 miles west of Mile 1167, Alaska Highway. The drilling was a continuation of an exploration program started in 1967 when bulldozer trenching and surface drilling was conducted on the property. The Company reports that the program has been suspended because the results from the underground drilling were disappointing. The property is the same one that Northwest Canalask Nickel Mines Ltd., dropped in 1964 and was restaked by the present owners. Found in 1952 the showing was developed by Canalask by surface exploration and underground work. Estimated ore reserves when exploration was stopped were 550,000 tons grading 1.62% nickel and 0.4% copper.

Manganese

Mount Grant Mines carried out surface prospecting, bulldozer trenching, overburden drilling and geological mapping on a manganese showing 30 miles north of Johnsons Crossing.

Coal

A minor amount of bulldozer stripping and drilling was carried out on coal leases south of Carmacks. The work was done by Anvil Mining Company. The Yukon Coal Company Limited who operated the Tantalus Butte Mine for many years, maintained a caretaker at the mine.

Nickel

Frobex Mines Limited completed 1,400 feet of drilling in 4 holes on its Bruce Lake Mines Limited nickel prospect located 25 miles east of Ross River.

Tungsten

Amex Exploration, a wholly owned subsidiary of American Metals, carried out geological mapping and diamond drilling program on a tungsten property 4 miles northwest of the Old Canal Road at MacMillan Pass; the property straddles the Yukon-N.W.T. boundary.

Atlas Exploration Ltd., have optioned two tungsten properties in a new area in the Pelly Mountains.

General

Spartan Explorations Ltd., holds nearly one thousand mineral claims in the Yukon. In 1967, this company carried out a major exploration and prospecting program in the area east of McPherson Lake and staked 780 claims. Nearly 200 claims were staked in other parts of the Territory. In 1968, as follow up to the 67 work, Spartan carried out a major exploration program comprised of surface prospecting, soil and silt sampling, geophysical surveys and geological mapping in three areas. The areas are the Logan Project east of McPherson Lake, the Fortin Lake area adjoining the Bay claims of Altas Exploration Ltd., and the Itsi Group of

claims in the Itsi Lake area southeast of Hudson Bay's Tom property. Spartan also carried out a general prospecting program in the eastern portion of the Yukon.

Newmont Mining Corp. of Canada Ltd., carried out regional stream sediment sampling, geological mapping and airborne geophysical surveys in the eastern central portion of the Yukon.

NORTHERN ECONOMIC DEVELOPMENT BRANCH

The administration of mineral exploration and economic development North of the 60th parallel and the implementation of government legislation is the responsibility of the Northern Economic Development Branch of the Department of Indian Affairs and Northern Development. The Federal Government offers a number of incentive programs designed to assist individuals and companies in the exploration and development of these resources including the following:

- Northern Mineral Exploration Assistance Program
- Northern Roads Program
- Northern Resource Airports Assistance Program
- Prospector's Assistance Program
- Assay Assistance.

Financial support in the form of grants is also given to organizations outside the government who materially contribute to the development of northern resources. These include the various chambers of Mines and Accident Prevention Associations. The Department also undertakes economic and feasibility studies or participates in such studies with industry to further promote northern development. Officers responsible for the above program of work are listed in the table below:



Adit entrance - Cadillac Exploration silver-lead property
on Prairie Creek, Nahanni District, N.W.T.

Department of Indian Affairs & Northern Development

Minister	Jean Chrétien	Ottawa, Ontario
Deputy Minister	J.A. MacDonald	Ottawa, Ontario
Asst Deputy Minister	J.B. Bergevin	Ottawa, Ontario

Northern Economic Development Branch

Director	A.D. Hunt	Ottawa, Ontario
Regional Director	G.A. McIntyre	Whitehorse, Y.T.
Regional Director	F.A. McCall	Yellowknife, N.W.T.

Oil and Mineral Division

Chief	H.W. Woodward	Ottawa, Ontario
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Mining Section

Administrator of Mining	B.J. Trevor	Ottawa, Ontario
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Inspection Services Unit

Chief Mining Engineer	S. Homulos	Ottawa, Ontario
Mining Engineers	G. Needham	Whitehorse, Y.T.
	M.L. Brown	Yellowknife, N.W.T.
Assistant Mining Engineer	J. Torrington	Whitehorse, Y.T.
Mine Rescue Superintendents	J.L. Comeau	Yellowknife, N.W.T.
	J.D. Barraclough	Whitehorse, Y.T.

Geological Evaluation Unit

Head	A.D. Oliver	Ottawa, Ontario
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Mining Lands Unit

Supervising Mining Recorders	R.J. Simard	Ottawa, Ontario.
	B. Baxter	Whitehorse, Y.T.
Mining Recorders	F.V. Daly	Ottawa, Ontario
	M. Monroe	Dawson, Y.T.
	R.G. Ronaghan	Mayo, Y.T.
	D.W. Gairns	Yellowknife, N.W.T.
	J.A.C. Mackenzie	Watson Lake, Y.T.

Development Analysis Section

Head	A.T. Jordan	Ottawa, Ontario
Assistant Head	L. Bereza	Ottawa, Ontario



Geologist logging diamond drill core in a core storage
Coppermine River Area, N.W.T.
Photo by National Film Board

MINING SECTION

Headed by an Administrator of Mining, this Section has the direct responsibility for the administration of all mining matters North of 60 including staking and recording of mineral claims, evaluation of representation work, production and safety inspections. It also has the responsibility of developing appropriate legislation pertaining to all mining matters. The section is further subdivided into three units: the Mining Lands Unit, Inspection Services Unit and the Geological Evaluation Unit.

Mining Lands Unit

For administrative purposes, the Yukon and Northwest Territories are divided into seven mining districts (see map on back cover). A Mining Recorder is in charge of each district. The districts and location of Mining Recorders' offices are as follows:

	District	Office
Yukon District	Mayo	Mayo, Y.T.
	Dawson	Dawson, Y.T.
	Watson Lake	Watson Lake, Y.T.
Northwest Territories	Mackenzie	Yellowknife, N.W.T.
	Nahanni	Watson Lake, Y.T.
	Arctic and Hudson Bay	Ottawa, Ontario

In addition to his administrative responsibilities in the Mining Districts, each Mining Recorder answers queries and distributes information pertaining to prospecting and other mining topics. Overall supervision of Recorders' offices

North of 60 is carried out by Supervising Mining Recorders located at Whitehorse, Y.T. and Ottawa, Ontario. The principal duty of these officers is to ensure that uniformity is maintained in the mechanics of administration of all Mining Acts and Regulations.

Mineral claims staked and recorded North of 60 during 1968 with comparative figures for 1967 are tabulated below:

Yukon Territory			Northwest Territories		
District	Claims 1967	Recorded 1968	District	Claims 1967	Recorded 1968
Whitehorse	4,295	3,960	Mackenzie	26,227	43,444
Dawson	236	434	Arctic &		
Mayo	685	2,129	Hudson Bay	1,290	526
Watson Lake	2,799	1,880	Nahanni	1,055	519
Total	7,415	8,403	Total	28,622	44,489

Inspection Services Unit

Headed by the Chief Mining Engineer for the Yukon and Northwest Territories, stationed at Ottawa, this unit is responsible for administration and preparation of various safety ordinances, rules and regulations pertaining to the safety in mines, oil well drilling rigs and other industrial operations North of 60°. In addition, the unit is responsible for Mine Rescue training and recovery operations, assay services and all other technical aspects of the mining industry.

Mine Rescue

There are two fully-equipped Mine Rescue Stations; one at Yellowknife, N.W.T., and one at Whitehorse, Y.T. Eighteen new Draeger BG 174, 4-hour breathing apparatus were purchased for the Yellowknife Station in 1968 and six more are to be added in 1969. The Whitehorse Station is equipped with 24 Draeger BG 174, 4-hour breathing units and twelve more will be purchased in 1969. In addition, Scott Air Pak ½-hour units are in use. Each Station, is under the supervision of a Mine Rescue Superintendent. Sub-Stations are established at remote mines each equipped with at least six, 4-hour oxygen breathing apparatus. Mine Rescue Superintendents travel to these remote mines to conduct mine rescue and first aid training as well as to ensure that the equipment is maintained in good order and ready for instant use.

Mine rescue teams compete annually in an interprovincial competition inaugurated by the British Columbia Department of Mines and Petroleum Resources in 1967.

Mining Safety—Yukon and Northwest Territories

The American Standard method of recording work injuries is used in recording accidents and calculations of frequencies and severities.

Disabling injuries are those which result in death, permanent total disability, permanent partial disability or temporary total disability.

Days recorded as lost time are calendar days lost but not including the day of the accident or the day of return to work. In the case of death, permanent total disability or permanent partial disability, schedule time charges set out in the above standard are used.

Accident Statistics—1968

To the end of December 1968, there were 108 disabling injuries reported in the Yukon. The accident frequency for disabling injuries increased from 50.7 in 1967 to 51 in 1968. Accident severity increased from 652 in 1967 to 3,441 in 1968. "Fall of persons" was the chief cause of accidents in the Yukon accounting for 28% of all accidents followed by "caught between two objects" and "strain while lifting". These three main causes accounted for 53% of the accidents reported.

There was one fatal accident during the year. On November 21, 1968, a surveyor was killed when he fell down a service raise in the United Keno Hill Mine.

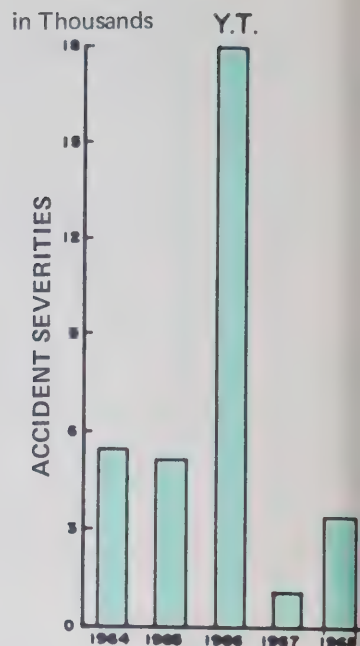


Mine Rescue Team composed of rescue men from Con-Rycon-Vol Mines and Giant Yellowknife Mines wearing McCaa breathing apparatus represented the Northwest Territories in the 2nd Canadian Mine Rescue championship competition at Penticton, B.C. June 1968.

MINING ACCIDENT SEVERITIES

Yukon Territory

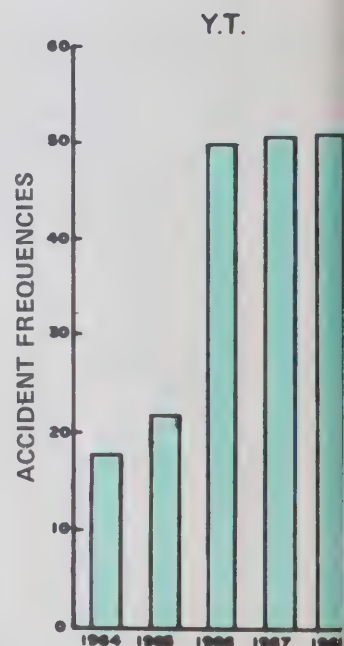
Mine	Number of Man Hours Worked 1968	Number of Days Lost Jan-Dec. 1968	Accident Severity Jan-Dec. 1968	Accident Severity Jan-Dec. 1967
Anvil Mining Corp.	236,534	77	326	430
Arctic Gold & Silver Mines Ltd.	159,884	132	826	0
Cassiar Asbestos Corp. . . .	577,866	53	92	194
Foley Silver Mines Ltd. . . .	11,885	4	337	0
Mount Nansen Mines Ltd. . .	165,431	222	1,342	1,457
New Imperial Mines Ltd. . .	348,460	92	264	343
Stump Mines Ltd.	45,050	63	1,398	0
United Keno Hill Mines Ltd.	535,504	6,563	12,256	745
Venus Mines Ltd.	29,051	63	2,169	8,193
Yukon Coal Co.	2,644	0	0	0
TOTAL	2,112,309	7,265	3,449	652



MINING ACCIDENT FREQUENCIES

Yukon Territory

Mine	Number of Man Hours Worked 1968	Number of Accidents Jan-Dec. 1968	Accident Frequency Jan-Dec. 1968	Accident Frequency Jan-Dec. 1967.
Anvil Mining Corp.	236,534	8	34	63.4
Arctic Gold & Silver Mines Ltd.	159,884	10	63	0
Cassiar Asbestos Corp. . . .	577,866	13	22	20.3
Foley Silver Mines Ltd. . . .	11,885	1	84	0
Mount Nansen Mines Ltd. . .	165,431	22	133	132.5
New Imperial Mines Ltd. . .	348,460	19	55	63.8
Stump Mines Ltd.	45,050	5	111	0
United Keno Hill Mines Ltd.	535,504	23	43	53
Venus Mines Ltd.	29,051	7	241	189
Yukon Coal Co.	2,644	0	0	0
TOTAL	2,112,309	108	51	50.7



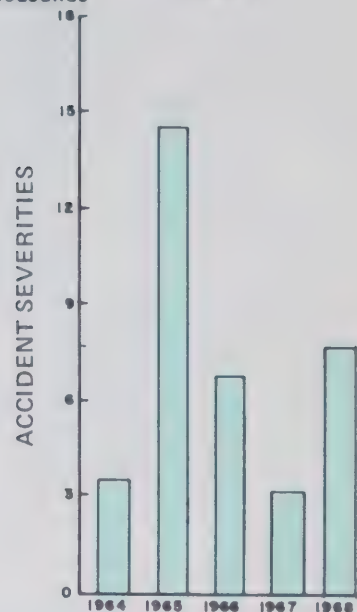
MINING ACCIDENT SEVERITIES

Northwest Territories

Mine	Number of Man Hours Worked 1968	Number of Days Lost Jan-Dec. 1968	Accident Severity Jan-Dec. 1968	Accident Severity Jan-Dec. 1967
Canada Tungsten Mining Corp. Ltd.	179,303	6,112	34,088	2,778
Con-Rycon-Vol	451,532	6,696	14,830	642
Discovery Mines Ltd. ...	263,570	129	489	1,067
Echo Bay Mines Ltd. ...	327,165	110	336	29,178
Giant Yellowknife Mines Ltd.	829,304	6,498	7,835	1,043
Pine Point Mines Ltd. ...	736,740	2,020	2,742	653
TOTAL	2,787,614	21,565	7,736	3,125

in Thousands

N.W.T.

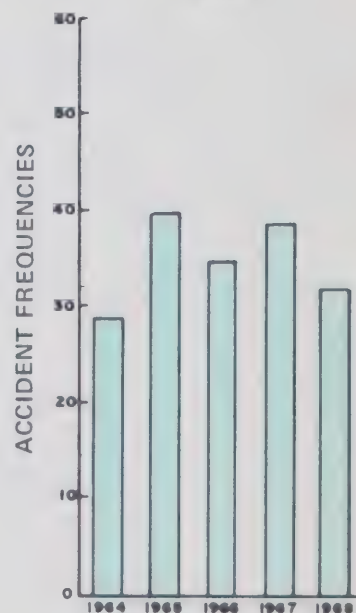


MINING ACCIDENT FREQUENCIES

Northwest Territories

Mine	Number of Man Hours Worked 1968	Number of Accidents Jan-Dec. 1968	Accident Frequency Jan-Dec. 1968	Accident Frequency Jan-Dec. 1967
Canada Tungsten Mining Corp. Ltd.	179,303	16	89	65.4
Con-Rycon-Vol	451,532	13	29	14.7
Discovery Mines Ltd. ...	263,570	8	30	39
Echo Bay Mines Ltd. ...	327,165	15	46	107
Giant Yellowknife Mines Ltd.	829,304	28	34	42.8
Pine Point Mines Ltd. ...	736,740	10	14	11.6
TOTAL	2,787,614	90	32	39.4

N.W.T.



CAUSES OF DISABLING INJURIES IN MINES

Yukon Territory

1968

CAUSES OF INJURIES	Anvil Mining Corp.	Arctic Gold & Silver Mines Ltd.	Cassiar Asbestos Corp.	Foley Silver Mines Ltd.	Mount Nansen Mines Ltd.	New Imperial Mines Ltd.	Stump Mines Ltd.	United Keno Hill Mines Ltd.	Venus Mines Ltd.	Yukon Coal Co.	TOTAL
Drilling								2	1		3
Caught between two objects			1		5	1	1	5	1		14
Strain while lifting	1	3	1		2	3		3			13
Fall of persons	2	3	2		9	6		6	2		30
Struck by moving object	2	1	4		1			1			9
Foreign matter in eyes . .	2				2	1	1		1		7
Tramming cars								1			1
Gas											-
Fall of rock							2	2			4
Falling object		1	2		1	1	1	2			8
Blasting											-
Misc.	1	2	3	1	2	7		1	2		19
TOTAL	8	10	13	1	22	19	5	23	7	0	108

CAUSES OF DISABLING INJURIES IN MINES

Northwest Territories

1968

CAUSES OF INJURIES	Canada Tungsten Mining Corp. Ltd.	Con-Rycon-Vol	Discovery Mines Ltd.	Echo Bay Mines Ltd.	Giant Yellowknife Mines Ltd.	Pine Point Mines Ltd.	TOTAL
Drilling						1	1
Caught between two objects . .	2	2	1	2	7	1	15
Strain while lifting	2			3	4		9
Fall of persons	5	1	1		5	3	15
Struck by moving object		2			3	2	7
Foreign matter in eyes	2		1	2	1		6
Tramming cars		1	1				2
Gas					1		1
Fall of rock		6	2	1	2		11
Falling object	1			1	1	1	4
Blasting			1				1
Misc.	4	1	1	6	4	2	18
TOTAL	16	13	8	15	28	10	90



Mine Rescue Team from United Keno Hill Mines wearing Draeger BG 174 breathing apparatus represented the Yukon Territory in the 2nd Canadian Mine Rescue championship competition at Penticton, June - 1968.

In the Northwest Territories, 90 disabling injuries were reported. Accident frequency decreased from 39.4 in 1967 to 32 in 1968 while the accident severity increased from 3,125 in 1967 to 7,736 in 1968. In the Northwest Territories "fall of persons" and "caught between two objects" were the two chief causes of accidents each accounting for 16.6% of all accidents reported.

There were three fatal accidents in 1968 compared to only one in 1967. On December 2, a drift miner was instantly killed when he was crushed between a derailed car and the drift wall on the 4900 level at Con Mine. Over-exertion and CO poisoning proved fatal to a Safety Supervisor during rescue operations at Giant Yellowknife Mines on January 10, 1968. At Canada Tungsten on July 24, 1968, a mine superintendent died instantly after falling from an H beam in the mill some 15 feet onto the cement floor of the mill building.

Geological Evaluation Unit

The function of the Geological Evaluation Unit is to provide assistance in the various stages of exploration, development and production of mineral resources in the Northern Territories. The unit is composed of an evaluation engineer located in Ottawa with supporting technical field staff.

The responsibility lies with the unit for evaluation of all geological, geophysical, geochemical and other like work submitted as representation work in respect of a mineral claim. The reports submitted under the Prospector's Assistance Program are reviewed. The applications for assistance under the Northern Mineral Exploration Assistance Program are technically evaluated and the same programs are reviewed for eligibility on completion of the work.

The unit maintains a library of technical reports submitted as representation work and as work programs under the Northern Mineral Exploration Assistance Program. These reports are available for perusal by the public once the confidential period is terminated. This unit maintains liaison with other government agencies at the Federal and Provincial level and with Industry in connection with advances in the geological field.

DEVELOPMENT ANALYSIS SECTION

This section initiates, implements and maintains policies and development programs and projects designed to stimulate the exploration for non-renewable resources in the Yukon and Northwest Territories.

The prime activities have been concerned with carrying out financial and engineering evaluations of resource developments in the Yukon and Northwest Territories where

government assistance has been requested and in administering programs designed to encourage resource development in the north. Included in these activities are the following:

Pine Point Smelter Study

This study was initiated as a result of requests from Pine Point Mines Limited to export large quantities of lead and zinc concentrates. It was considered that the possibility of processing these concentrates in the Northwest Territories should be investigated thoroughly in view of the benefits that such an industry would have to the economy of the north. The study has now been completed and a thorough assessment made of the conclusions and the socio-economic benefits which would result from a smelter. Reports will be made public early in 1969.

Anvil Mining Corporation Limited

Detailed studies of the Anvil Mining Corporation Limited mining project in the Ross River area of the Yukon were completed. An agreement between the Company and the Government was negotiated whereby the Government would provide assistance in the construction of roads, bridges, power, communication and townsite facilities. The Company, on the other hand, agreed to employ specified numbers of Yukon residents and also, subject to certain conditions of profitability, to build a smelter within eight years of coming into production. The mine is expected to come into production in late 1969.

Baffinland Iron Mines Limited

In view of present Government budgetary restrictions, further work on this project was suspended temporarily. This Company owns a large, high grade iron ore property on northern Baffin Island and had requested Government assistance of approximately \$32.0 million for the provision of a railroad, roads, airstrips, harbour facilities and a townsite. An interdepartmental task force was established to study the project and engineering and financial studies were carried out.

Roads Program

The section was represented on both the Interdepartmental and the Branch Committees on Northern Roads. Financial assistance for road construction was recommended for Mount Nansen Mines Limited, Anvil Mining Corporation Limited, Arctic Mining and Exploration Limited, and New Imperial Mines Limited. In addition, background information was provided to the Committee on proposed area development roads in both the Yukon and Northwest Territories.

Airstrip Program

The section was represented on the Northern Airports Advisory Committee. Financial assistance for airstrip construction was recommended for Pacific Giant Steel Ores Limited, Great Bear Trophy Lodge Limited, and Glenlyon Mines Limited.

Surveys and Mapping Co-ordination

The section assumed the responsibility to co-ordinate the Department's requirements for control surveys and mapping with the Department of Energy, Mines and Resources.

INCENTIVE PROGRAMS

Prospectors' Assistance Program

In both the Yukon and Northwest Territories, a combined amount of \$60,000 is granted to aid prospectors in their search for mineral deposits. A prospector may receive up to \$900.00 each year to help finance his prospecting venture. The program has been well received since its introduction in 1962 and was instrumental in the successful location of several mineral discoveries.

During 1968, the entire amount of \$60,000 was committed. Fifty-four prospectors in the Northwest Territories and thirty-eight in the Yukon Territory participated in the program this year.

Northern Mineral Exploration Assistance Program

This program is designed to encourage mineral exploration activity in the Yukon and Northwest Territories by providing grants of up to 40 per cent of the cost of approved exploration programs for minerals or oil and gas in the north. One hundred and eight corporate applicants have applied for assistance in one or more programs of exploratory work. Sixty-six applications have been approved and a total of \$1,487,500 has been paid in grants leaving an outstanding commitment of \$1,992,450. Moreover, payments of \$5,012,500 have been made towards a large program of oil and gas exploration in the Arctic Islands.

Northern Roads Program

The Northern Roads program which was approved by the Federal Government in 1965 called for an annual expenditure of \$10 million for the following 10 years in both territories. It is the first phase of a long-range 20 year program designed to bring all potential areas of resource development within 200 miles of the nearest permanent road. The policy was designed to be sufficiently flexible to allow revisions in priorities from year to year to keep pace with resource development. It also allowed for a shift in

volume of construction from one Territory to another, depending on the requirements and based on northern territorial development.

Instead of placing emphasis on resource potential alone, the road program is based on a multiple concept having as its objective the creation of a broad network of road-loops to serve all needs.

The total estimated Federal expenditure on northern roads for 1968-69 will be \$8,757,600 and the total mileage of new and reconstructed roads was 120 miles, 45 miles in the N.W.T. and 84 in the Yukon.

The following is a list of projects conducted during the year under this program.

Northwest Territories

Mackenzie Highway—N.W.T.I.

In March 1968, a 2-year contract was awarded to Western Construction and Lumber Co. in the amount of \$3,086,415 for clearing 119 miles of road right-of-way and building 62 miles of subgrade. This is a further extension to the 50 miles completed in 1967-68 and leaves another 10 miles of clearing and 67 miles of subgrade to be constructed in order to reach Fort Simpson. Work in 1968 progressed favourably.

Yellowknife Roads

A two-year contract in the amount of \$446,801 was awarded in July 1968 to Freeway Construction (Northern) Ltd. for construction of about 6 miles of connector roads between the Yellowknife Highway, Ingraham Trail and the town of Yellowknife. Work is progressing favourably.

General Surveys for Future Development Roads

Work in excess of \$300,000 was completed in 1968 and consisted of: 30 miles of ground location survey on each of the Fort Simpson-Fort Liard and Fort Smith-Fort Reliance routes; air photograph and mapping on the Fort Smith-Fort Reliance route and the Ingraham Trail. Contracts were also entered into for photography and mapping of the proposed Mackenzie Highway in the Inuvik area. Preliminary reconnaissance surveys were also carried out on a possible route from Rae to Coppermine and on a number of other minor projects.

Yukon

Ross River — Carmacks Road YT 9

The road from Watson Lake to Ross River to Carmacks has now been designated the Campbell Highway by the government of the Yukon.

The two-year contract in the amount of \$2,133,752 let to General Enterprises Limited in October 1967 for construction of a 42-miles central section of this route was completed in 1968 except for minor clean-up work. The other road contracts mentioned in the 1967 report are now completed. Contracts were let in 1968 for construction of bridges over Bearfeed and Drury Creeks and this work was about 75% completed. The Ross River-Carmacks Road was opened to traffic in the fall of 1968.

Whitehorse-Keno Road

This road now forms part of a route designated by the Yukon Government as the *Klondike Highway* which, when completed, will extend from Skagway through Whitehorse, Carmacks, Stewart Crossing and westward to Dawson.

In 1968, a one-year contract in excess of \$600,000 was completed with the upgrading of a 32-mile section between Whitehorse and Carmacks to trunk road standards. It is proposed to complete the upgrading of the road between these two points in 1969.

Stewart Crossing-Dawson Road

This road is now part of the newly named Klondike Highway. Work in the amount of some \$385,000 was expended in 1968 to upgrade various sections of this road. Main emphasis was in the Dawson area where the road was reconstructed from the Ogilvie Bridge to the ferry landing. Several smaller bridges on the road were also replaced.

Boundary Road

A contract in the amount of \$280,150 was awarded in May 1968 to Don Gordon Ltd. for gravel surfacing and stockpiling on this road. The work has been completed.

Canol Road

Work in excess of \$200,000 was carried out in 1968 in reactivating the Canol Road from Ross River northward to Sheldon Lake, a distance of some 80 miles. This work was completed as schedule.

Access Roads

Anvil Mines Access Road

Under terms of the Northern Roads Policy, Anvil Mines Corporation began construction of an 18-mile Permanent Access Road from a point on the Ross River-Carmacks road approximately 28 miles west of Ross River, northerly to the site of their mine. This work included a major bridge over the Pelly River. Approximately \$1,000,000 was expended in 1968 on the project which is now about ²/₃ completed.

An initial Access road, under the Northern Roads Policy, was started south of Carcross by Venus Mines Limited in 1968. About 4 miles of the 14-mile road was near completion and several more miles roughed in before work shut down for the winter.

The Mount Nansen Mines Access Road, which lies west of Carmacks, was completed to Initial Access road standard although it was originally intended to build it to Permanent Access road standard. *The Arctic Gold and Silver Mines road* south of Carcross was completed in 1968 to Permanent Access road standard under terms of the Northern Roads Policy.

Surveys for Future Development Roads

Photography and mapping were completed on the proposed Dempster Highway where some recent route revisions had been made. Ground location surveys were also carried out on the existing Dempster Road, mile 0-78, which is due for reconstruction at some future date. Miscellaneous surveys were carried out on a number of smaller projects at various locations.

Tote Roads

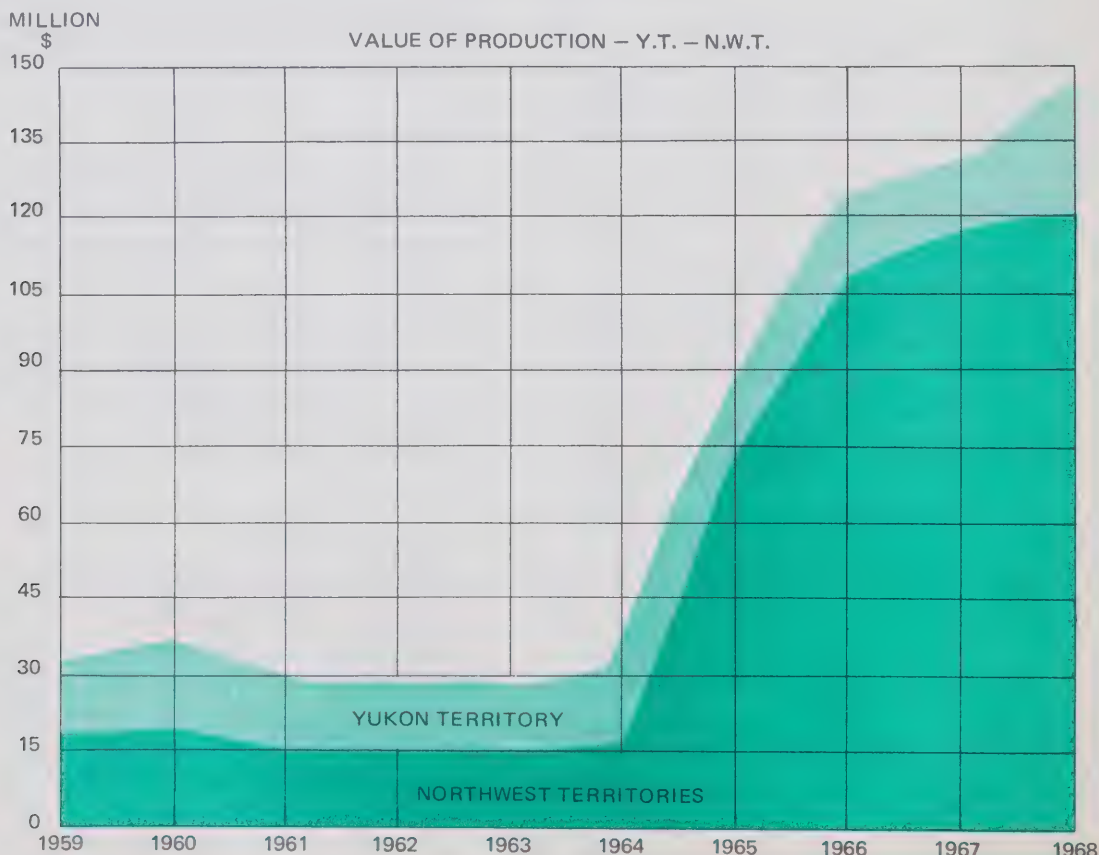
In addition to road and airstrip assistance which is administered by the Federal Government there is available in each Territory \$100,000 each year for the construction of

low class roads to provide temporary seasonal or year-round access in connection with any natural resource development project. The program is administered by the Commissioner of each Territory. Construction is the responsibility of the individual or company concerned and costs incurred for such roads may be shared up to a maximum of 50% of the cost.

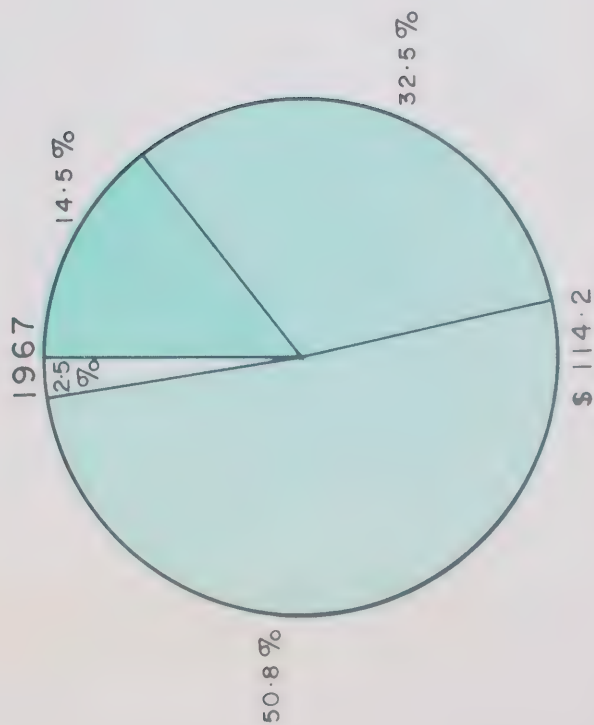
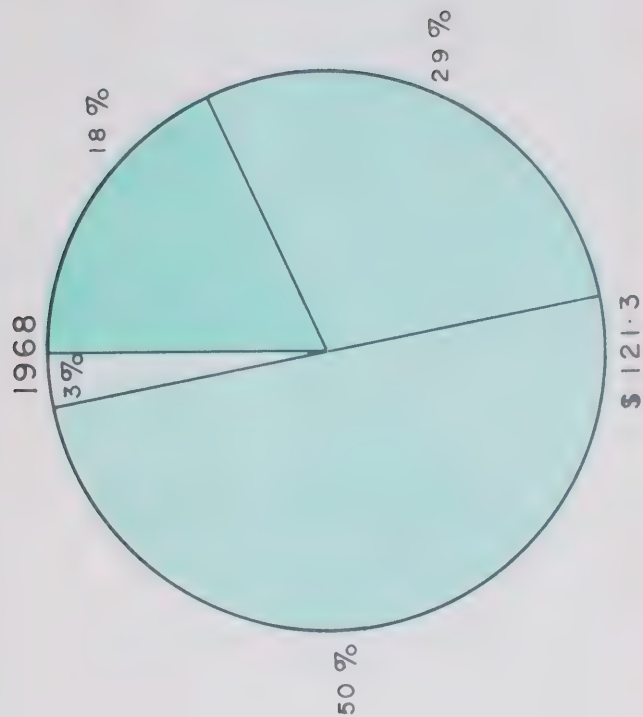
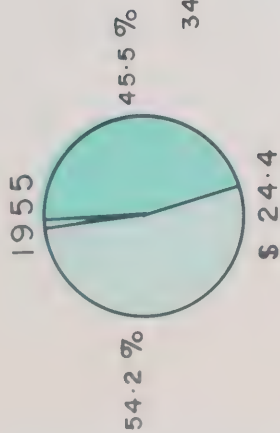
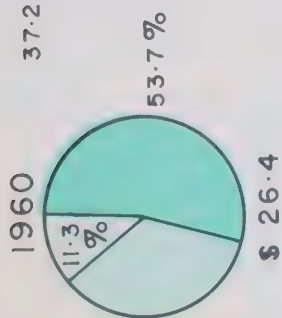
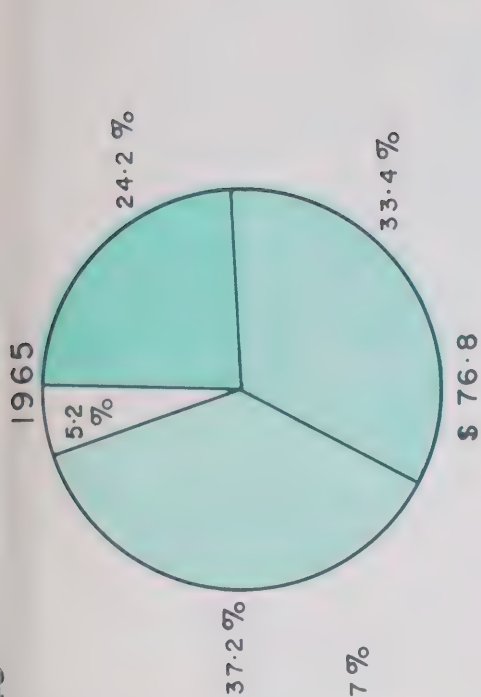
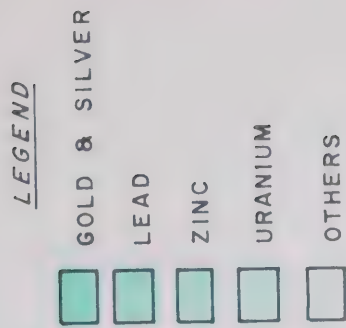
During 1968 in the Northwest Territories, twelve applications for tote road assistance were approved covering oil, mining, agriculture and tourist enterprises. Funds allocated under contract amounted to \$94,700.00 to construct 835 miles of year-round road and 420 miles of winter roads for a total of 1255 miles. In the Yukon, 26 applications were approved for the construction of 342 miles of tote roads. Funds allocated under contract were \$94,197.00.

Assay Services

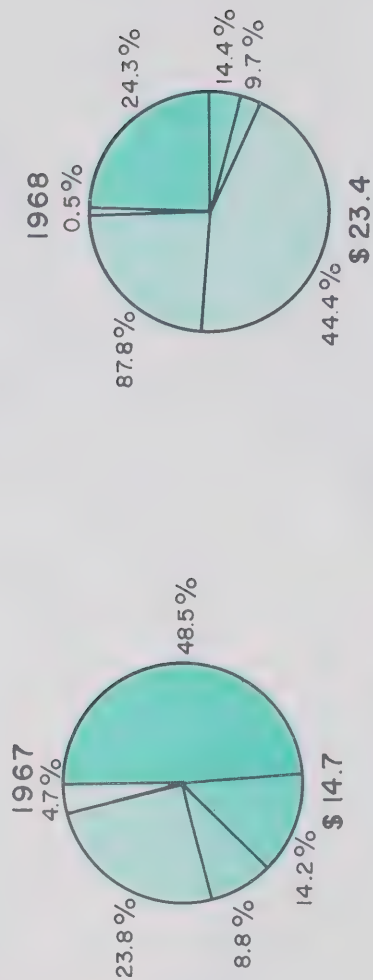
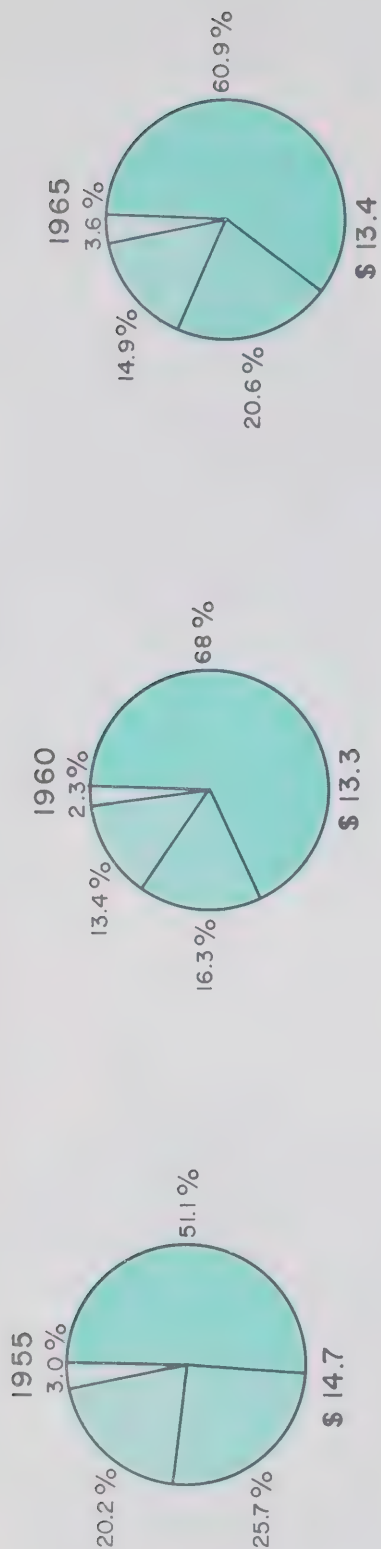
The Government Assay office at Yellowknife carried out about 2,400 assays during the year. Free assays performed either under the provisions of the Prospector's Assistance Program or as provided for under the Canada Mining Regulations, amounted to 1,000 determinations at a value of \$2,400.00. In the Yukon Territory, 50% of the cost of ten assays per prospector, per year, is paid by the Federal Government and during 1968, approximately 650 assays were paid for at a cost of \$2,212.25 to the Federal Government.



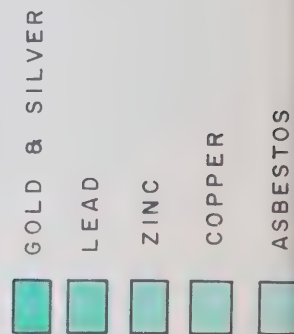
VALUE OF PRODUCTION BY MINERAL NORTHWEST TERRITORIES 1968



VALUE OF PRODUCTION BY METALS YUKON TERRITORY 1968



LEGEND

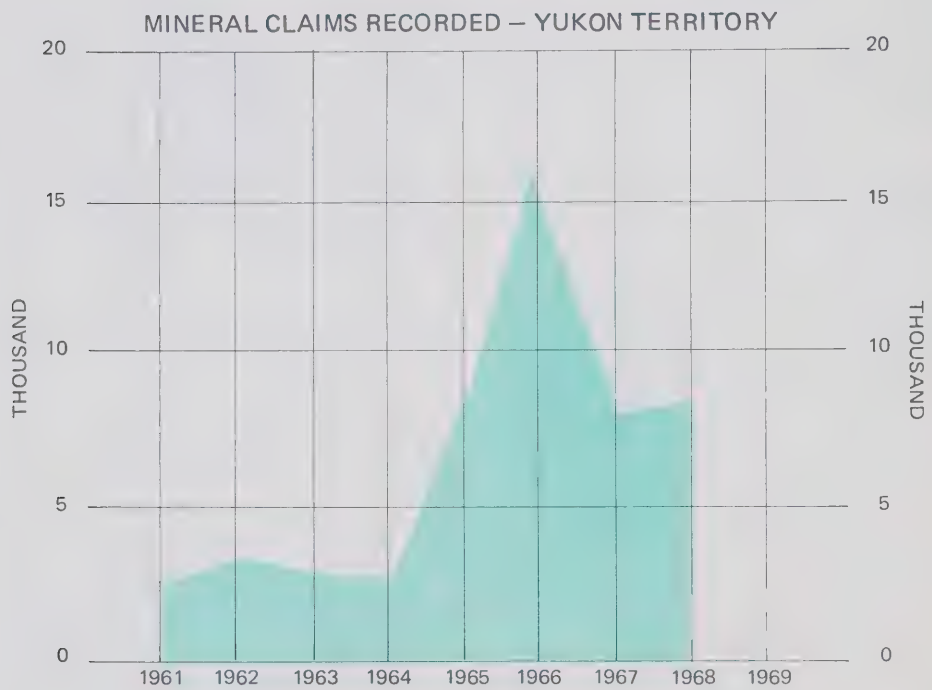
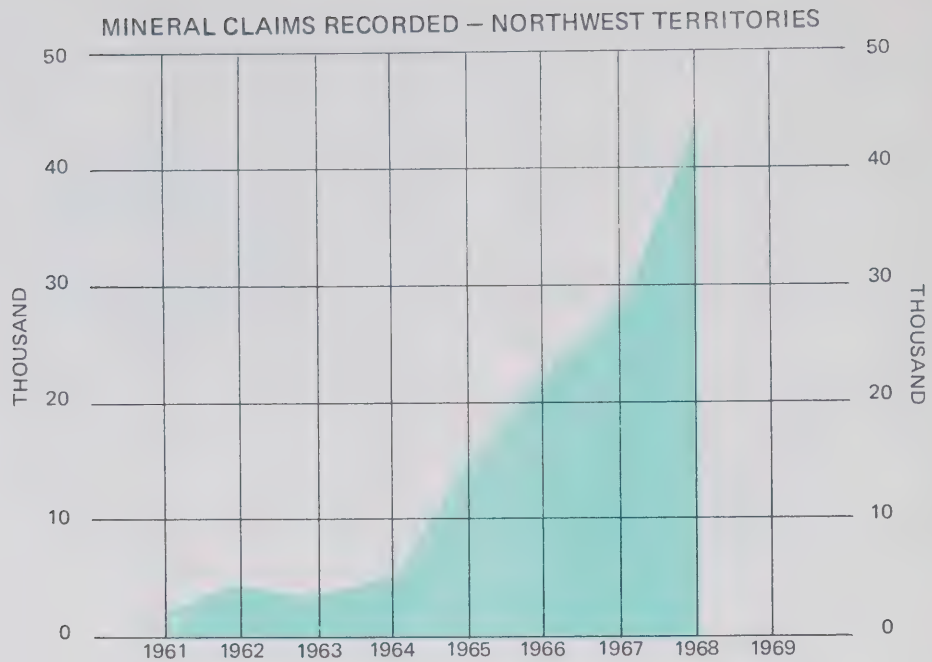


MINERAL PRODUCTION CHART - 1959 TO 1968

NORTHWEST TERRITORIES

Mineral	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968(a)	Cumulative Totals(b)
Gold..... \$	13,626,802	14,194,631	14,449,028	14,974,924	14,609,250	15,586,182	17,071,580	15,990,133	14,356,476	13,085,822	266,572,576
ounces	405,922	418,104	407,474	400,292	387,000	412,879	452,479	424,029	380,304	347,012	
Silver..... \$	61,937	70,659	73,419	84,814	107,216	91,312	1,490,754	2,325,407	3,429,755	8,938,132	18,126,520
ounces	70,560	79,473	77,890	72,802	77,468	65,223	1,064,824	1,662,192	1,980,228	3,855,967	
Copper..... \$	292,157	315,016	270,440	194,928	10,281	.....	354,342	672,065	538,077	946,108	3,936,541
pounds	986,682	1,040,000	926,480	628,801	32,638	.....	942,400	1,496,805	1,131,126	2,097,800	
Nickel..... \$	2,689,239	2,669,645	2,604,789	1,503,837	.....	.....	.....	.....	.....	.....	12,850,205
pounds	3,841,770	3,813,778	3,409,410	1,801,002	.....	.....	.....	.....	.....	.....
Lead..... \$	.....	.....	.....	.....	.....	823,279	25,677,695	31,472,562	35,665,535	35,152,000	128,791,071
pounds	.....	.....	.....	.....	.....	6,125,588	165,662,547	210,659,720	254,753,820	260,000,000	
Zinc..... \$	.....	.....	.....	.....	.....	1,111,016	28,596,474	57,128,344	60,852,900	60,630,000	208,318,734
pounds	.....	.....	.....	.....	.....	7,840,620	189,380,626	378,333,400	419,964,800	430,000,000	
Pitchblende(d). \$	8,155,729	9,231,698	.....	.....	.....	.....	.....	.....	.....	.....	79,477,897
pounds	919,333	1,077,211	.....	.....	.....	.....	516,635	2,769,372	2,551,920	2,565,000	8,402,927
Cadmium..... \$	.....	.....	.....	.....	.....	.....	185,840	1,073,400	911,400	900,000	.....
pounds	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
TOTAL..... \$	24,825,864	26,481,649	17,397,676	16,758,503	14,726,747	17,611,789	76,707,480	110,357,883	117,394,663	121,317,062	726,476,471
YUKON TERRITORY											
Gold..... \$	2,247,847	2,652,004	2,371,494	2,050,255	2,084,215	2,183,611	1,698,975	1,639,103	675,725	941,128	266,029,877(c)
ounces	66,960	78,115	66,878	54,805	55,211	57,844	45,031	43,466	17,900	24,957	
Silver..... \$	6,192,556	6,416,956	6,538,897	7,551,814	8,450,755	7,894,196	6,462,393	5,868,217	6,701,756	4,778,635	133,027,015
ounces	7,054,632	7,217,361	6,937,086	6,482,244	6,106,037	5,638,712	4,615,995	4,194,580	3,869,374	2,061,534	
Lead..... \$	2,290,960	2,166,638	1,712,198	1,615,980	1,867,647	2,744,235	2,766,953	2,386,684	2,141,959	951,117	56,277,307
pounds	21,592,456	20,286,871	16,769,815	16,290,125	16,978,607	20,418,415	17,851,309	15,975,125	15,299,709	7,034,890	
Copper..... \$	.....	.....	257,098	132,990	.....	.....	.....	.....	3,409,779	5,755,550	12,267,112
pounds	.....	.....	880,773	429,000	.....	.....	.....	.....	7,167,919	11,965,800	
Coal..... \$	58,200	97,156	114,221	115,198	123,675	98,150	85,626	46,390	15,791	.....	2,567,132
tons	3,879	6,470	7,703	7,649	8,231	7,229	8,801	5,670	1,912	.....
Zinc..... \$	1,621,375	1,789,287	1,528,100	1,438,554	1,514,520	1,855,512	2,000,396	1,729,027	1,373,151	685,260	34,422,678
pounds	13,246,532	13,402,899	12,137,418	11,888,876	11,850,706	13,094,653	13,247,653	11,450,510	9,476,545	4,860,000	
Cadmium..... \$	181,440	206,604	228,296	231,328	326,124	428,399	386,192	306,336	265,997	144,638	5,596,533
pounds	141,750	145,496	142,685	134,493	135,885	132,222	138,918	118,735	94,999	50,750	
Asbestos..... \$	.....	.....	.....	.....	.....	.....	.....	.....	406,371	10,240,000	10,646,371
tons	.....	.....	.....	.....	.....	.....	.....	.....	2,260	64,000	
TOTAL..... \$	12,592,378	13,328,645	12,750,304	13,136,119	14,366,936	15,204,103	13,400,535	11,975,757	14,990,529	23,496,328	520,834,025

(a) Preliminary Figures (b) Cumulative Totals - 1932 to December 31, 1968 (c) Cumulative Totals - 1886 to December 31, 1968 (d) Figures for years 1932, 1943, to 1953 not available.



MINERAL EXPLORATION AND MINING-YUKON & N.W.T.

SCALE OF MILES

0 100 200 300

Legend
 ▲ Producing Mine
 △ Mining Prospect
 ✕ Airport
 — Airfield
 — Commercial Airline
 — Routes
 — Existing Roads
 — Railway

DEPARTMENT OF INDIAN AFFAIRS AND NORTHERN DEVELOPMENT

501 AND MINERAL DIVISION

TABLE OF COMPANIES

1. PINE POINT MINES LTD. (LEAD-ZINC)
2. ANVIL MINING CORPORATION LTD. (LEAD-ZINC-SILVER)
3. KERR-ADDISON MINES LTD. (LEAD-ZINC-SILVER)
4. BAFFINLAND IRON MINES LTD. (IRON)
5. GINER MINES LTD. (GOLD)
6. GINER MINES LTD. (GOLD)
7. UNITED KENO HILL MINES LTD. (LEAD-ZINC-SILVER-CADMIUM)
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11. COCKEY MINES LTD. (GOLD)
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16. CHRYSTAL MINES LTD. (GOLD)
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18. CONQUEST MINES LTD. (LEAD-ZINC)
19. CONQUEST MINES LTD. (LEAD-ZINC)
20. CONQUEST MINES LTD. (LEAD-ZINC)
21. TONAS GULF SULPHUR CO. INC. (ZINC)
22. SUPERCREST MINES LTD. (GOLD)
23. SELCO EXPLORATION CO. LTD. (GOLD)
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25. INTERCONTINENTAL MINES LTD. (LEAD-ZINC)
26. GALMA HOLDING LTD. (LEAD)
27. PCE EXPLORATION LTD. (COPPER)
28. ARCTIC MINING AND EXPLORATION LTD. (GOLD)
29. ARCTIC MINING AND EXPLORATION LTD. (GOLD)
30. SILVER KEY MINE LTD. (SILVER)
31. SILVER KEY MINE LTD. (SILVER)
32. ATLAS EXPLORATION LTD. (COPPER)
33. CASINO SILVER MINES LTD. (SILVER)
34. HUDSON BAY MINING & SMELTING CO. LTD. (NICKEL)
35. YUKON ANTIMONY CORPORATION LTD. (ANTIMONY)
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37. VENUS MINES LTD. (SILVER-GOLD)
38. BALLARAT MINES LTD. (GOLD)
39. PURE SILVER (SILVER-LEAD)
40. PURE SILVER (SILVER-LEAD)
41. SILVER CITY MINES (COPPER)
42. COPPER HILL MINES LTD. (COPPER)
43. COPPER HILL MINES LTD. (COPPER)
44. HIGHLAND BELL LTD. (COPPER)
45. QUADRATE EXPLORATION LTD. (COPPER)
46. QUADRATE EXPLORATION LTD. (COPPER)
47. PROPRIETARY MINES LTD. (COPPER)
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49. HEARNE COPPERMINE LTD. (COPPER)
50. HART RIVER MINES (COPPER)
51. TERRA MINING AND EXPLORATIONS LTD. (SILVER)
52. LORAL MINES LTD. (GOLD)
53. SILVER BAY MINES LTD. (SILVER)
54. CAESAR SILVER MINES LTD. (SILVER)





activities

1969



north
of 60

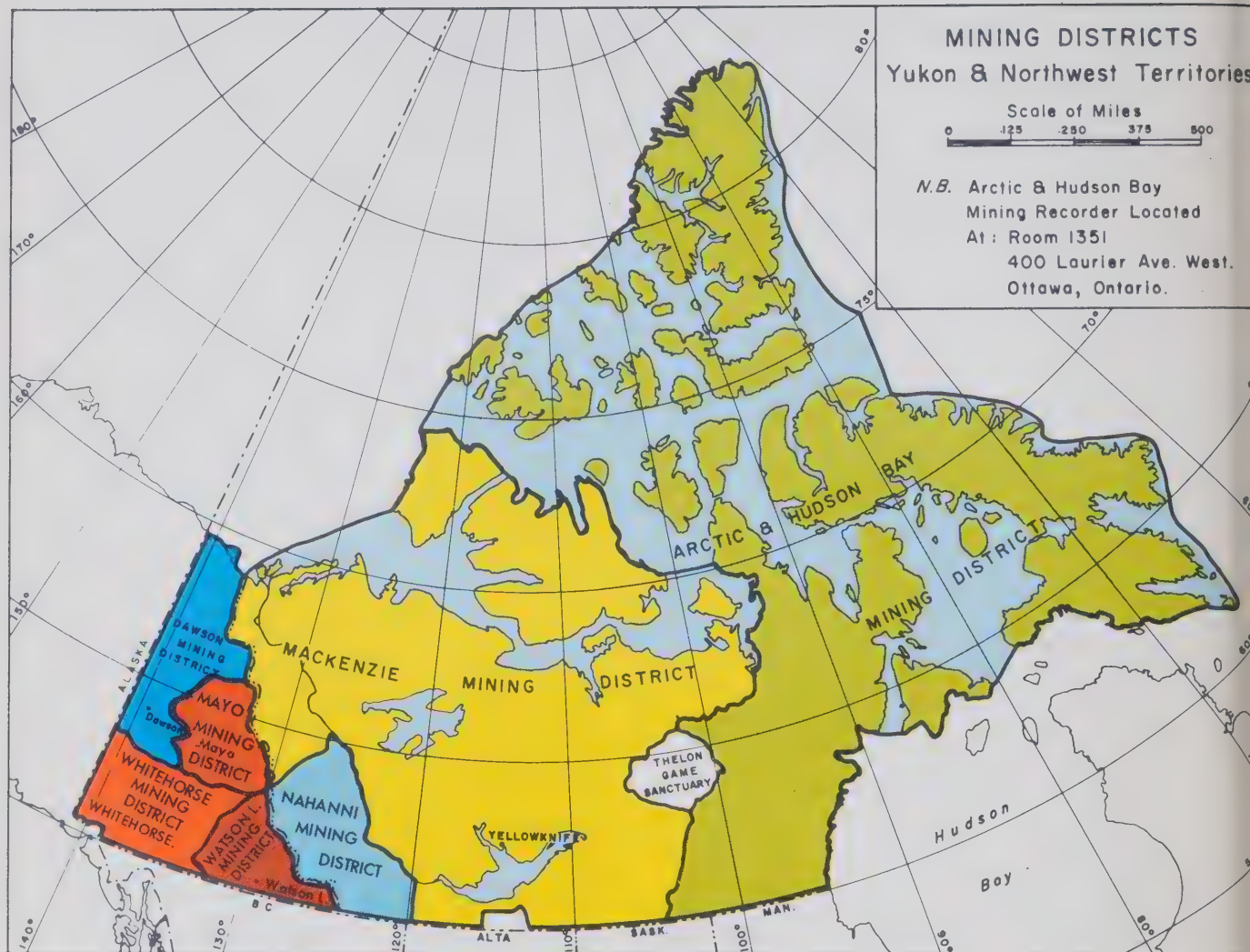
mines and minerals



northern economic
development branch
department of indian affairs
and northern development
government of canada

IA61

5



MINES & MINERALS NORTH OF 60°

MINING ACTIVITY IN THE YUKON

AND

THE NORTHWEST TERRITORIES

An annual publication issued under the authority of the Honourable
Jean Chrétien, P.C., M.P., B.A., LL.L. Minister of Indian Affairs and
Northern Development.

Northern Economic Development Branch. Department of Indian
Affairs and Northern Development — Ottawa

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Northern Economic Development Branch

Mining Section

Mining Lands Unit	
Inspection Services Unit	
Mine Rescue	
Mining Safety — Yukon & Northwest Territories	
Accident Statistics — 1969	
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Production

Mining Activity in 1969 in the Northwest Territories was highlighted by the granting of 103 Prospecting Permits. These permits gave exclusive rights (for 3 years) to several companies to explore for minerals on approximately 500,000 acres of mining lands in the Eastern Mackenzie, Inuviat and Franklin Districts, and required work expenditures of \$1.85 million during the first year. In the Yukon a staking rush developed in the Casino-Canadian Creeks area, and by year end in excess of 10,000 mineral claims had been staked and recorded in the area. This is the Yukon's 5th major staking rush since 1965.

With the Anvil Mine now in production in the Yukon at a designed milling rate of 5,500 tons per day and Pine Point reaching a rate of 10,000 tons per day, the North has become the largest source of lead and zinc in Canada. It is expected that when Anvil reaches its full milling capacity, the annual value of lead-zinc production from that part of Canada north of the 60th parallel will exceed \$100,000,000.00.

The centre of exploration activity in the Yukon has moved to the Casino-Canadian Creeks area and this will continue in 1970. Most of the companies in this area are very enthusiastic about copper molybdenum prospects. However,

considerable interest is also being generated in other parts of the Yukon in view of the rising copper prices. At least two other prospects, one in the Dawson area (copper), and the other in the Kluane Lake area (nickel and copper) are of interest. Underground exploratory work has been conducted on both properties and feasibility studies are currently in progress.

In the Northwest Territories, exploration activity is swinging to the eastern sector — the Hudson Bay area and the Arctic Islands. An exploratory adit was driven on one silver-lead-zinc prospect on Baffin Island during the latter part of 1969 and the feasibility of bringing the property into production is under study. Exploratory work will, however, continue on the widespread copper occurrences in the Coppermine River area as well as in the east Great Slave Lake region.

The year 1970 promises to be another year of intense exploration activity in both Territories despite the fact that the number of claims recorded in 1969 dropped considerably from the record breaking 1968 season when some 52,000 claims were registered. The value of mineral production will show another substantial increase and should reach \$180,000,000.00.



Bridge across the Pelly River on the Campbell Highway running from Carmacks to Faro and the Anvil Mine, Yukon Territory - August 1969. Photo by George Allen Aerial Photos

NORTHWEST TERRITORIES

PRODUCING MINES

Mineral production in the Northwest Territories for 1969 indicated by preliminary Dominion Bureau of Statistics figures is valued at \$115,446,563.00. This is slightly higher than the final Bureau figure for the 1968 production — \$14,771,116.00. Most of this increase is due to higher metal prices, in particular lead and zinc. There was a substantial increase in the dollar value of silver sales due to a drop in the price of silver. There was also a decrease in the value of gold production because of the closure of the Discovery Mine in May of 1969.

Availability of labour improved during the year. Most of the mines have well-developed training programs in operation and more experienced miners have been available than in the past. Labour turnover is still high, but productivity has greatly improved. Several mines have instituted improved training programs and the percentage of married personnel employed in the mines is increasing.

Gold

Mount Yellowknife Gold Mines Ltd.

Location	—	1.5 miles north of Yellowknife
Product	—	gold
Rate	—	800 tons per day
Grade	—	0.73 ounces per ton
Reserves	—	1,275,450 tons
Employees	—	413

Tonnage milled increased by 5% compared with the previous year and production of gold increased by 9%. The Giant mill has a milling capacity of 1,000 tons per day and approximately 800 tons of ore per day are supplied from the Giant mine with the remainder from the Supercrest and Lolor Mines which are adjoining and inter-connected.

Supercrest Mines Ltd.

Location	—	1.5 miles north of Yellowknife and adjoining Giant
Product	—	gold
Rate	—	100 tons per day
Grade	—	0.76 ounces per ton
Reserves	—	81,400 tons
Employees	—	operated by Giant

Development work at Supercrest is continuing and ore production from stope development is exceeding forecasts. The 1,100 foot level drift has reached the ore zone and a raise is being driven up to the 750 level which has been the lowest working level to date.

Engineering evaluation work is in progress on the mining of Supercrest ore. The narrow, discontinuous high-grade veins require different mining methods from the wide Giant zones. Depending on the results of work on the 1,000 foot level, a decision will have to be made whether to drive another long drift from the Giant workings on the 1,500 foot level or to deepen the Akaitcho shaft in order to develop the deeper portions of the ore-body.

Lolor is inter-connected with Giant on the 425 foot level and ore from Lolor is milled at the Giant mill at an approximate rate of 100 tons per day. Lolor is owned 87½ per cent by Giant and 12½ per cent by Conwest Exploration Ltd.

Lolor Mines Ltd.

Location	—	1.5 miles north of Yellowknife and adjoining Giant
Product	—	gold
Rate	—	100 tons per day
Grade	—	0.71 ounces per ton
Reserves	—	331,428 tons
Employees	—	operated by Giant

Con-Rycon-Vol Mines Ltd.

Location	—	1.5 miles south of Yellowknife
Product	—	gold
Rate	—	525 tons per day
Grade	—	0.67 ounces per ton
Reserves	—	not available
Employees	—	225

The rate of production was the lowest since 1964 when mining and milling was curtailed for 2½ months as a result of a fire that destroyed the hoistroom. Plans were in progress at year end to increase present milling capacity by 15%.

A long drift to the south on the 2,300 foot level was advanced 1,400 feet during the year and progress is on schedule. 1,200 feet of this advance was in Yellorex ground and Con Mine and Yellorex have entered into an agreement whereby Con will develop and mine the Yellorex ore body.



Open-pit mine at Clinton Creek, Y.T., 40 miles northwest of Dawson operated by Cassiar Asbestos Mining Corporation Ltd. - August 1969.

Photo by George Allen Aerial Photos

Sinking of the C-2 winze from the 4,900 foot level commenced in October and the winze is now 330 feet below the 5,000 foot level. This winze will be driven to the 5,500 foot level and an additional 500 feet below this level is being considered. The C-2 winze is in the vicinity of the original shaft sunk from surface to the 2,300 foot level. Results from exploratory drilling in this area will be a factor in arriving at a decision whether to inter-connect these two shafts.

Discovery Mines Ltd.

Location	—	50 miles north of Yellowknife
Product	—	gold
Rate	—	225 tons per day
Grade	—	0.23 ounces per ton
Reserves	—	Nil
Employees	—	225

Mining operations terminated in April and milling ceased in May. Production this year was merely a clean-up operation and amounted to production of 8,000 ounces of gold from 10,000 tons of ore milled.

Lead-Zinc

Pine Point Mines Ltd.

Location	—	South shore of Great Slave Lake 50 miles east of Hay River
Product	—	lead and zinc
Rate	—	8,000 tons per day
Grade	—	9.5% combined lead-zinc
Reserves	—	39,300,000 tons
Employees	—	427

The average daily tonnage mined — 10,000 tons — was up 10% from 1968 and 136% from 1967; however, the average grade being mined declined to 10% combined metals. Total lead-zinc production was maintained and with an increase of 10% in the price of lead and zinc in 1969, the gross value of production was the highest since production was attained in 1964.

Production was divided almost equally between Sphinx (the Pyramid orebody) and the Pine Point ore-bodies. Most of the ore from the open pits is stockpiled near the primary crusher and re-loaded with a large overhead-type wheeled loader onto trucks for the short haul to the crusher. This system has permitted a great deal of flexibility resulting in increased efficiency in the pits and in transportation and has also allowed the mill to control grade and tonnage within narrow limits.

A system of deep water wells and pumps around the perimeter of the pits has been very successful in lowering the

water table to provide dry operations in even the deepest pits. This has resulted in some re-adjustment in the limits between open-pit and underground operations.

A shaft-sinking program is planned for next summer to open up one ore body for underground operations. This will give management some answers to the problems of water control, mining methods and costs. Some of the deeper mineral occurrences cannot be considered as mineable ore until these problems have been resolved.

The mine has commenced an on-the-job training scheme aimed at increasing the percentage of native population in the work force. The first participants of the course are proving reliable workers and the program will be expanded to attract residents of communities outside the Pine Point area.

Silver-Copper

Echo Bay Mines Ltd.

Location	—	Great Bear Lake
Product	—	Silver-copper
Rate	—	100 tons per day
Grade	—	63 ounces silver per ton 2.2% copper
Reserves	—	not available
Employees	—	87

Tons milled, grade, and ounces of silver produced showed a decrease from the previous year; however, production was still over two million ounces and a grade of 63 ounces of silver per ton is impressive.

A new addition to the mill, built to increase milling capacity and recovery, is now in use. Thus an increase in productivity is expected in 1970.

Recent development has indicated high silver values on the bottom level. Plans are now under review to sink the shaft an additional five levels during 1970;

Silver-Bismuth

Terra Mining and Exploration Co. Ltd.,

Location	—	40 miles south of Great Bear Lake
Product	—	silver-copper-bismuth
Rate	—	300 tons per day
Grade	—	not known
Reserves	—	not known
Employees	—	35

The mine commenced production in September, and the mill has been in operation on a testing basis since that time.

Production for the year is about 8,000 tons, half from the surface stockpile, and half from underground development work. About 300 tons of concentrate have been produced, and stored at the mine prior to shipping over the winter road.

Access to the underground workings consists of an adit, 11' by 15', inclined at 17% for a length of 2,000 feet, 600 feet of which is the ore zone. A raise, 5' by 7' has been driven to surface, about 300' vertical distance. An intermediate level has been established and development work is proceeding from this level.

The mill machinery is new, except for the primary crusher and is rated at 325 tons per day, but will be run initially at 100 tons per day. A jig concentrate of silver and native bismuth is produced and there are two banks of flotation cells, one to provide a copper-silver concentrate and the other a bismuth concentrate. Some experimental work is being done on cobalt recovery, but results to date have not been announced.

An airstrip has been cleared and some work done on grading but it is not ready for operations. Present access is by float plane to the Camsell River during the summer and to an ice strip on Hohum Lake during the winter. Byers Transport are putting a winter road into the property this winter.

A shallow area of rapids on the Camsell River, downstream from the mine has been blasted and cleared, providing barge transportation to the mine from Great Bear Lake. Fuel oil and heavy supplies were brought into the mine by barge during the summer.

Tungsten

Canada Tungsten Mining Corporation Ltd.

Location	—	125 miles north of Watson Lake, Y.T.
Product	—	tungsten-copper
Rate	—	350 tons per day
Grade	—	1.61% tungsten, 0.45% copper
Reserves	—	814,000 tons
Employees	—	68

With the addition of a regrind unit and other equipment in the mill, the efficiency of the concentrator has been further improved, thus permitting Canada Tungsten to mill a lower grade ore and thereby extending the indicated life of the mine. The modifications in the milling circuit have made it possible to maintain tungsten recovery at 80%, with a mill feed as low as 1.4%.

MINING DEVELOPMENT

Silver-Lead-Zinc

Texas Gulf Sulphur, who own a group of claims on Strathcona Sound on the northern tip of Baffin Island drove a 1,500 foot exploration adit on an ore-body previously outlined by diamond drilling and carried out a bulk sampling program. The previous surface diamond drilling had indicated 12,000,000 tons of ore containing approximately 1.3 ounce of silver per ton, 8.8% zinc and 1% lead. Studies are now being conducted to determine the feasibility of bringing the property into production. Underground exploratory work is expected to resume in 1970 and a decision made regarding production plans.

Cadillac Explorations Ltd. hold 210 claims on Prairie Creek in the Nahanni District covering silver-lead-zinc deposits. Surface exploration to-date consists of stripping and trenching on 12 outcrops along a strike length of 6 1/2 miles.



over 10,000 feet of diamond drilling, geophysical surveys, strip construction, air-strip construction and in excess of 45 miles of exploration roads. 4,000 feet of underground mining and cross-cutting has been completed from 4 adits. Most of this work was carried out in the 1968 and 69 seasons. Exploratory work is scheduled to continue into 1970, following which a feasibility study of the possibilities of putting the property into production will be made.

EXPLORATION

Oil exploration companies joined mining companies in carrying out many varied programs in all parts of the Northwest Territories during 1969. The highlight of the year was perhaps the issuing of 103 prospecting permits in the territories of which 96 were for the purpose of uranium exploration in the Keewatin District, the eastern part of the Mackenzie District and on southern Baffin Island. Exploration work continued on copper occurrences in the Coppermine River area, Victoria Island and the East Arm of

Great Slave Lake, on nickel occurrences east of Artillery Lake and in the Dubawnt Lake area, on silver occurrences in the Camsell River and Bathurst Inlet areas, on lead-zinc occurrences in the Pine Point and northern Baffin Island areas, on silver-lead occurrences in the Nahanni and on iron prospects on Baffin Island and the Melville Peninsula.

Copper

Coppermine River Area

Coppermine River Ltd. (14)* concluded further ground geophysical studies on its various claim groups in the Hope Lake area. The company also directed geophysical programs on adjoining ground owned by Teshierpi Mines Ltd. and

* Number refers to location of property — Mineral Exploration and Mining Map.



Use of Helicopter in Northern Exploration - King Resources Company operation
on prospecting permit - Baffin Island - August 14, 1969.

Photo by B. Trevor

Northville Explorations Ltd. Interest was centered along projections of the Herb Dixon and Teshierpi Faults. In addition, a limited drilling program was carried out on an anomalous zone in the DOT Group, several miles east of the No. 47 zone. 1,000 feet of drilling was also done on Teshierpi Mines Ltd. ESC claims located some 30 miles NE of Hope Lake. In this area, copper mineralization is exposed along the Coppermine River. Interestingly enough, this occurrence is not in basalts, but in the overlying Upper Coppermine River Series sediments.

Expenditures for the seasons work totalled more than \$140,000 according to company officials.

Bernack Coppermine Exploration Ltd. ⁽¹⁴⁾ as a follow-up to last seasons work, carried out a drilling program on its JUNE claim group located some 45 miles east of Hope Lake. Work this year centered on the JUNE 'break', a mineralized shear zone discovered last season. During the 1969 season a 10,000 foot drilling program outlined an estimated 1,000,000 tons of ore-grade copper mineralization. Bernack also directed and conducted geophysical programs on the properties of Eskimo Copper Ltd., Pascas Oils Ltd. and Donalda Mines.

Hearne Coppermine Ltd. ⁽¹⁴⁾ conducted a geochemical survey on its contiguous RT, LASH, LIZ and ELGOK claim groups. These groups are located 25 to 30 miles NE of Hope Lake and cover the Upper Coppermine River Series clastic sediments on which company geologists conducted detailed stratigraphic and lithologic studies.

Pickle Crow Explorations Ltd. ⁽¹⁴⁾ conducted a drilling program near Amco Lake. Pickle Crow in conjunction with Area Mines Ltd. holds more than 1600 claims in the area. In addition, the company has options on adjoining claim groups belonging to Coronation Gulf Mines and Spectroair Ltd.

Silver Arrow Explorations Ltd. ⁽¹⁴⁾ conducted a limited drilling program on several geochemical anomalies located last season.

Rose Pass Mines Ltd. ⁽¹⁴⁾ conducted a drilling program on a "flat" ore zone inferred from previous drilling and I.P. surveys.

Giant Yellowknife Mines Ltd. ⁽¹⁴⁾ conducted a short drilling program on an inferred projection of the Teshierpi Fault. Its property is located some 25 miles NE of the No. 47 zone.

Conwest Exploration Company Ltd. ⁽¹⁴⁾ carried out geophysical and limited drilling programs on various claim groups in which it holds a principal interest. Much of the

work was conducted on the 1500 claims of East Coppermine Exploration Co. Ltd. which is under the management of Conwest.

Other companies conducting exploration programs in the Coppermine River area this season included September Mountain Mines Ltd., Continental McKinney Mines, Jarvis Bay Mining Corp., Colonial Oil and Gas Ltd., Rolling Hills Copper Mines Ltd. and Todd Exploration. Most of the programs consisted of ground EM and magnetometer surveys.

Bathurst Inlet Area

Territory Mining Company Ltd. and Hearne Coppermine Ltd. ⁽¹⁵⁾ sister companies within the Brametia Resource organization, conducted limited geological and prospect reconnaissance on their various claim groups. Little encouragement was obtained.

Arlington Silver Mines Ltd. ⁽¹⁵⁾ conducted geological and geophysical programs on its BOB, DUNC, and T



s. Further work has been recommended by L.J. King and Associates, the consultants who carried out the work.

Victoria Island Area

Copper mineralization in the Natkusiak Formation, a series of Proterozoic volcanics similar to the Coppermine volcanic series, promoted renewed interest during the season. Following preliminary investigations in 1967 and 1968, four contiguous permit areas covering more than 100 acres each were taken out by the Muskox Syndicate Mines, Coltrin Investments, Hearne Coppermine Explorations, James Operators Ltd., Kodiak Petroleum Ltd., Summit Cons. Mines, Marjad Ltd., Merland Oil Co. of Canada, Silvermaque Mining, Siscoe Mines, Spooner Mines, T.C. Explorations, Noble Oils, PCE Explorations and Solaris Corp.).

At the same time other companies staked several thousand acres in the district to cover areas of Natiusiak volcanics

outside the permit areas and the claim groups held by Muskox.

Total expenditure in the various programs conducted during 1969 on Victoria Island is estimated at well over 1.5 million dollars.

Muskox Mines Ltd.⁽¹⁶⁾ conducted an integrated program of prospecting, geophysics, geological mapping reconnaissance together with limited test drilling. Several interesting areas requiring further work were delineated. The 1969 helicopter-supported program was directed by the consulting firm of Watts, Griffis and McQuat Ltd.

Grandroy Mines Ltd.⁽¹⁶⁾ carried out a program of geological and prospecting reconnaissance together with limited test drilling on its OX claims.

Fidelity Mines Ltd.⁽¹⁶⁾ conducted geological and prospecting reconnaissance on its V, C, P and R claim groups.



Inuit bagging bulk samples from outcrop at Texas Gulf Sulphur lead-zinc property at Strathcona Sound on Baffin Island, N.W.T. - August 13, 1969.

Photo by B. Trevor

These four groups total nearly 1,800 mineral claims.

The abnormally short summer season together with the vagaries of weather served to make exploration programs exceedingly difficult. At the same time, transportation facilities to the area, except by aircraft, are practically nil. For these reasons seasonal exploration program costs are excessively high. The successful negotiation by the Manhattan of the Northwest Passage, while no solution for the transportation problem of the area, does serve to indicate future possibilities of cheap marine transportation for any ores developed in this region.

Other Areas

Shield Resources Ltd.⁽¹⁷⁾ conducted geological mapping and limited test drilling on its Isabella Lake property located 200 miles north of Yellowknife. This deposit lies in a sequence of acid pyroclastics.

Giant Yellowknife Mines Ltd.⁽¹⁸⁾ staked two groups of claims on new copper discoveries resulting from a prospecting program in the East Arm area of Great Slave Lake. Extensive geological evaluation is planned for next year.

Polar Star Mines Ltd.⁽¹⁹⁾ conducted a geological examination of several groups of claims staked this season in the High Lake area. This area is 350 miles North of Yellowknife near the Arctic Coast.

Lead – Zinc

Pine Point Area

Cominco Ltd.⁽²⁰⁾ conducted I.P. surveys and limited test drilling on several newly acquired claim groups in the Buffalo River area to the west of its Pine Point Mines.

Buffalo River Exploration Ltd. (20) (Newconnex, Central Patricia and Conwest) conducted additional drilling and geophysical work in order to further outline its lead and zinc orebodies and bring this property to lease. Studies are continuing on the feasibility of bringing this and other small deposits into production in view of the rising lead and zinc prices.

Baffin Island

King Resources Company (21) conducted a helicopter supported geochemical survey on its six contiguous prospecting permit areas on the Borden Peninsula. Several interesting anomalies were located and additional geological work is planned for next year. The technical work is under the direction of Hunttec Ltd.

Hackett River Area

Bathurst Inlet Mining Corp. (22) conducted a detailed drilling program on its lead, zinc, copper and silver showing located 250 miles NE of Yellowknife in the Contwoyto Lake region. In the 13 holes (totalling 2,902 feet) which were drilled this season, several intersections of ore grade were supported by values in silver, lead and copper were obtained. As a result of this encouragement, much staking occurred in this vicinity.

Norsemines Explorations Ltd. (22) conducted a geophysical survey on its DL and RN claims as well as geological mapping program on their OX group.

Silver

Great Bear Lake Area

With the continuing success of Echo Bay Mines and announcements by Terra Mining and Development of its intention to put its Camsell River silver property into production, much exploration activity was generated in this area during 1969.

Caesar Silver Mining Ltd. (24) conducted geological mapping and sampling on its ITLDO claims. Following this program, the claims were optioned to Norex Ltd., Vancouver. This latter company plans extensive development work next season.

Copper Pass Mines Ltd. (24) prospected its GIN claims.

Coronation Gulf Mines (24) together with Spectroair Ltd. conducted magnetometer and EM surveys on their AG and JK claims. The technical work was directed by Anglo Celtic Exploration.

Great Bear Silver Mines (24) carried out an EM and magnetometer survey under the direction of Precambrian Mining Services Ltd. The survey covered the 24 DP claims.

Jim Rock Mines Ltd. (24) conducted a geophysical program with limited test drilling on its AN claims.

Jason Explorers Ltd. (24) prospected and sampled various occurrences on the MAG group of claims.

Klyceptor International (24) directed EM and magnetometer surveys together with radiometric surveys on various claim groups in the area.

Louanna Gold Mines Ltd. (24) conducted an EM and magnetometer survey on its DOC and DAN claims.

Mylander Mines Ltd. (24) conducted geological a

geophysical programs on its CPM, CONTACT and CAMERON claim groups (totalling 99 claims).

Republic Mining (24) investigated several silver-bismuth workings and prepared a preliminary geological map of its 10 claim group.

Ulster Petroleum Ltd. (24) re-opened the workings on the property of the former Acadia Mines and conducted an underground sampling program. The aim of the program was to block out a significant tonnage of silver ore for custom milling by Echo Bay Mines. The orebody also carries significant values in uranium.

Thurst Inlet Area

Hope Bay Syndicate (25) conducted an integrated program of prospecting and detailed geological mapping with limited test drilling on its VAN mineral claims. Interest was centered on high-grade native silver occurrences located several years ago by Noel Avadluk, an Eskimo prospector. These claims are located 420 miles NE of Yellowknife in the Thurst Inlet area.

Gold

Yellowknife Area

Northbelt Yellowknife Mines Ltd. (26) completed a two year program of detailed geological mapping on the PA claims. A program of follow-up drilling on targets, inferred from the extremely detailed geological work, produced quite encouraging results. Northbelt (51% Falconbridge) owns or controls most of the claim groups covering the Yellowknife Greenstone Belt north of the Giant Yellowknife mine.

Hidden Lake Mines Ltd. (27) continued with underground exploratory drifting. While significant gold values are being countered, no systematic development has been attempted. Activities at the 'mine', located some 20 miles northeast of Yellowknife, are presently under the direction of Mr. Frank Avery of Yellowknife.

Aulieu River Area

Duke Mining Ltd. (27) conducted a detailed drilling program on its TA claims. The drilling tested a narrow high grade gold vein. Several intersections containing high gold values are reported. The property is located about 40 miles east of Yellowknife.

Spectrum Resources (27) drilled a zone of irregular quartz veins on its AA claims located some 35 miles east-northeast of Yellowknife.

Uranium

The news of a significant uranium discovery at Wollaston Lake, Sask. as reported by Gulf Exploration Ltd., generated enthusiastic and widespread interest in exploration for this metal in the Northwest Territories. As a result 93 prospecting permit areas were taken out by various mining and oil companies. Activities centered on the Dubawnt Lake, Baker Lake, Ennadai, Snowbird and Henik Lake areas. To the west, activities continued in the Nonacho Lake — Pilot Lake areas. At the same time uranium occurrences in Central and Southern Baffin Island were being investigated. A variety of geologic settings amenable for economic uranium deposits are known in the Territories. Possibilities include pegmatite, clastic breccia (Blind River-type), gneiss/mylonite (N. East Alberta-type), urano-auriferous conglomerate (Witts-watersrand-type), sand-stone (Colorado-type) and hydrothermal vein (L. Athabasca-type) deposits. Much of the preliminary regional work, in the form of airborne surveys using very sophisticated instrumentation, was carried out this year. Ground follow-up programs employing geophysical and geochemical techniques were also underway.

District of Keewatin

This year, 72 exploration permits were granted in this district, to the following companies or syndicates: Ensign Oils Ltd.; W.E. Bakke Oil Co.; Cousins Minerals Ltd.; Canada-Northwest Land Co.; Graham M. Ackerly; Yellowknife Bear Mines Ltd.; Cons. Energy Corp. Ltd.; Eldorado Nuclear Ltd.; Wainoco Oil and Chemicals Ltd.; Yukon Geothermal Co. Ltd.; Abidonne Oils Ltd.; Prudhoe Bay Oils Ltd.; New Continental Oils Ltd.; Republic Resources Ltd.; Aquitaine Co. of Canada Ltd.; Silver Arrow Explorations Ltd.; Canadian Export Gas and Oil Ltd.; Canadian Homestead Oils Ltd.; Marwood Petroleum Ltd.; Central Del Rio Oils Ltd.; Canadian Delhi Oils Ltd.; Legal Wellstrippers Ltd.; Houston Oils Ltd.; Kary Explorations Ltd.; and Canadian Gridoil Ltd.

Aquitaine Co. of Canada Ltd. (29) conducted an airborne radiometric survey followed by ground follow-up programs on its permits in the Baker Lake region.

Ensign Oils Ltd. (29) (with Fort Reliance Minerals) conducted airborne radiometric surveys and geological reconnaissance programs of their permits in the Baker Lake and Dubawnt Lake areas.

Dennison Mines Ltd. (31) (together with Lakehead Mines, Roman Corp. and Argosy Mines Ltd.) carried out extensive programs of geological mapping together with geophysical surveys on their various claim groups coveting a belt of favourable conglomerates in the South Henik Lake area.

Iso Mines Ltd. (31) carried out prospecting and geological mapping on its 475 claims in the South Henik Lake area.

New Continental Oil and Gas Ltd. (29) reported sub-ore grade uranium mineralization encountered in a drilling program conducted in the Baker Lake-Chesterfield Inlet area. Here New Continental and others (Marlin Development Ltd.) are participating in an exploration program on Permit Area No. 109. Extensive work is planned through the winter.

District of Mackenzie (Eastern)

In the Eastern Mackenzie District 16 exploration permits covering areas in the Dubawnt and Snowbird Lake areas were granted to the following companies: Canadian Homestead Oils; Fargo Oils Ltd.; Gage Canadian Oil & Gas Corp.; Canadian Gridoil Ltd.; Canadian Delhi Oils Ltd.; Canex Aerial Explorations; Kary Explorations Ltd.; Wainoco Oil and Gas; W.E. Bakke Oil Co. Ltd.; (with Esperanza Oil Ltd.); Canadian Gridoil Ltd.; Buttes Resources Ltd.; Houston Oils Ltd. (with Trudel Minerals Ltd.); Canada North-West Land Co.; Bow Valley Land Co.; and United Bata Resources Ltd.

Nonacho-Pilot Lake Areas

Canadian Superior Exploration Ltd. (32) conducted a \$16,000 (helicopter supported) geophysical and geological reconnaissance on the east side of Hjalmar Lake, 175 miles south-southeast of Yellowknife. Two large blocks of claims, the MA and SNOOPY groups were added to the 200 KAY and 120 NN claims which Canadian Superior took over from New Continental Oil and Gas. A program of test drilling was initiated and will continue over the winter.

Eldorado Nuclear Ltd. (32) conducted a geological reconnaissance in the same general area as Canadian Superior.

Texas-Gulf Sulphur Ltd. (32) conducted a preliminary geological investigation on its DAK claims.

Capillano Explorations Ltd. (32) drilled 1,260 feet in 6 test holes on its 35 NON claims;

Canex Aerial Explorations Ltd. (32) conducted an airborne radiometric survey over its T and TOP claims. The survey was under the direction of Trigg, Woollett and Associates.

Barringer Research Ltd. (35) conducted a regional geochemical survey in the Tsu Lake area (30 miles NE of Pilot Lake) for an undisclosed client.

District of Mackenzie (other Areas)

King Resources Ltd. (36) conducted geological and geophysical studies together with limited test drilling on the

DAN, DB and CROWN claims (118 claims) in the Wopmay River district, 175 miles NE of Yellowknife. Work was directed by Trigg, Woollett and Associates.

Giant Yellowknife Mines Ltd. (36) conducted a geophysical reconnaissance and limited sampling program on DV claims optioned this year from DeVries Mining (Shield Resources). DeVries Lake is 140 miles NW of Yellowknife.

Mariner Mines Ltd. (24) followed last year's drilling program with a scintillometer survey, prospecting and trenching. Uranium mineralization as well as copper were reported to occur on its various claim groups (FIN, FUL, NOR, BEVIS and CM), located 10 miles north of the Echo Bay mine in the Great Bear Lake area.

Moresby Mines Ltd. (24) carried out a program of trenching sampling and geophysical surveys on its GP claims located 25 miles east of Echo Bay.

District of Franklin – Baffin Island

The Amadjuak Syndicate (38) (together with Boreas Mines Ltd.) conducted airborne geophysical surveys and ground investigations on their five exploration permits on the Foxe Peninsula of Baffin Island (Permit Nos. 78, 79, 80, and 82).

Nickel

Artillery Lake – Hanbury River area

Led by *Newmont Mining Corp.* a staking rush developed in the Hanbury River-Artillery Lake district some 240 miles east of Yellowknife. Minor nickel mineralization discovered during preliminary investigations in 1968 prompted Newmont to stake 800 claims along a northeast-trending belt of Precambrian gneisses and metamorphosed basic intrusions whose geological setting and regional magnetic characteristics are strikingly similar to those in the Thompson, Manitoba nickel belt.

Geoterrex Ltd. (39), in co-operation with Newmont Mining Corp., Giant Yellowknife Mines Ltd. (with Falconbridge Nickel Mines Ltd.), Shield Resources, Nunavut Oil and Gas Ltd., Precambrian Mines Services Ltd. and Giant Explorations Ltd., flew a preliminary airborne EM and Magnetometer survey. The data from this survey was used as a basis for follow-up ground geophysical programs by 10 participants.

Newmont Mining Corporation of Canada Ltd. (39) conducted an integrated program of ground geophysics, geological reconnaissance, geological mapping and diamond

ing on its ART, GAP, SAP, MC and SNO claims (total of mineral claims). Not counting drilling, these programs incurred expenditures of over \$125,000.00.

Cominco Ltd. (39) conducted ground geophysics, geological reconnaissances and mapping on 392 claims optioned on Coronation Gulf Mines, Spectroair, Arlington Silver and at Northern Petroleums.

Giant Yellowknife Mines Ltd. (39) (with Falconbridge Nickel Mines Ltd.) conducted a combined program of geological mapping, ground geophysics and diamond drilling. More than 20 short holes were drilled on various geophysical anomalies, but nothing significant was intersected.

Hanbury Syndicate (39) with Rayrock, Jorex, Consolidated Canadian Faraday and Conwest Explorations, conducted EM and magnetometer surveys and geological reconnaissance.

Discovery Mines Ltd. (39) carried out EM and magnetometer surveys on its 200 JCB claims.

Giant (Mascot) Explorations Ltd. (39) carried out ground geophysical and geological mapping programs on its GM (300) claim group.

Other companies conducting ground geophysical investigations in the Hanbury River-Artillery Lake areas were: Acroll and Gas Ltd.; Largo Mines; Flagstone Mines; Tay River Mines; Slocan Ottawa Mines, Fleet Trading; Texore; Black Mt Mines Ltd.; Nahanni Mines (with Fort Reliance Minerals); Bathurst Inlet Mining Corp.; and Norsemines Explorations Ltd.

In view of the discouraging results obtained by Newmont, most other companies suspended further work in the district at the end of the field season. Few of these companies are expected to return next season.

East Arm Area, Great Slave Lake

Copper Pass Mines Ltd. (40) conducted a prospecting program followed by a bulk sampling program on a small, high-grade niccolite deposit on Sachowia Point, 75 miles east of Yellowknife. A market for the ore has been secured and shipment of hand-cobbed ore, averaging 25–30% Ni is expected to begin next year. Copper Pass obtained the claims (GOGO Group) from Jim McAvoy of Yellowknife early this year. To date, several hundred tons have been bagged at the property.

Jason Explorers Ltd. (40) conducted a bulk sampling program on a high grade cobalt-nickel showing in its DEE claims on Blanchet Island. To date approximately 200 tons of hand-cobbed ore have been bagged at the small open pit operation and it is reported that a French firm may buy the ore. Geological mapping of the showing has been done as well as prospecting and staking on other areas of Blanchet Island. The grade of ore varies from 5 to 20% Ni and 5 to 20% Co.

Iron

Borealis Explorations Limited (42) continued a program of geophysics, geological mapping and bulk sampling on its iron prospect located on Melville Peninsula. To date, 2 zones have been delineated. The west zone, the more promising of the two, is over 600' wide and has been traced some 10,000 feet along strike.

Patino Mining Corporation (42) conducted a geological mapping and sampling program on claim blocks (245 claims) in the Ege Bay area of Central Baffin Island.

Niobium

Giant Yellowknife Mines Ltd. (43) continued a program of surface stripping, geological mapping and sampling on their niobium prospect at Big Spruce Lake, 140 miles NW of Yellowknife.

YUKON TERRITORY

PRODUCING MINES

The value of mineral production in the Yukon increased from a 1968 figure of \$23,496,328 to \$37,655,800 in 1969. New asbestos, lead, zinc and silver production accounted for this growth. The production comes from three open-pit mines and four underground mines. The open pit mines include an asbestos mine, a lead-zinc silver mine and a copper gold, silver mine. Underground mining includes two gold-silver mines, a coal mine and a silver-lead-zinc-cadmium mine.

Some 30-40 placer miners continue to work the old Dawson and Burwash camps with bull-dozers and sluice boxes, picking up fair gold values in many cases from old workings.

Gold — Silver

Arctic Gold and Silver Mines Ltd.

Location	—	8 miles south of Carcross
Product	—	gold, silver, lead, zinc
Rate	—	100 tons per day
Grade	—	Gold 0.48 oz./ton Silver 19.6 oz./ton
Reserves	—	22,900 tons (January 1969)
Employees	—	46

Arctic Gold and Silver Mines Limited operated for nine months and was closed because of the longshoreman's strike in Vancouver preventing the transport of concentrates to market in Boliden, Sweden. A new adit was driven below the production adit and some 1,900 feet of lateral development completed to cut the downward extension of #6, #7 and #2 veins.

1,500 feet of raising was completed on both levels and a certain amount of stoping started on the lower adit. The present proven reserves are unknown. The mine produced 4,627 oz. of gold and 119,887 oz. of silver in the nine month period.

Mount Nansen Mines Ltd.

Location	—	45 miles west of Carmacks
Product	—	gold, silver
Rate	—	100 tons per day
Grade	—	Gold 0.50 oz./ton Silver 18.4 oz./ton
Reserves	—	330,000 tons
Employees	—	58

Mount Nansen Mines Ltd. closed on April 15, 1969 and was placed on a caretaker basis, but is planning to re-open with a cyanide plant addition to the present mill. The company also plans to treat ore from an adjoining property — the Brown-McDade. In the four month operating period 1969 some 10,687 tons were milled for a production of 1,809 oz. of gold and 55,532 oz. of silver.

Silver — Lead — Zinc

United Keno Hill Mines

Location	—	26 miles northeast of Mayo
Product	—	silver, lead, zinc, cadmium
Rate	—	240 tons per day
Grade	—	39.2 oz. silver; 6.5% lead; 5.5% Zn; 0.05% cadmium
Reserves	—	100,230 tons
Employees	—	267

United Keno Hill Mines Ltd. continued operations at the Elas, Calumet, Husky and Sadie-Ladue locations, mining from adits and shafts. The rehabilitation of Sadie-Ladue mine continued and the Husky Shaft was de-watered and crosscuts driven toward a new ore body of three levels.

Anvil Mining Corporation Ltd.

Location	—	130 miles northeast of Whitehorse
Product	—	lead, zinc, silver
Rate	—	5,500 tons per day (to be increased to 6600 tons)
Grade	—	3.4% lead, 5.7% zinc, 1 oz. silver per ton
Reserves	—	63,000,000 tons
Employees	—	238

Anvil Mining Corporation Ltd. commenced production at the Anvil Mines, Faro, Yukon Territory in September. The open pit preparations, mill, townsite, access road, Whitehorse loading terminal and bulk loading terminal at Skagway were all completed during the year and the freighter Helina loaded the first shipment of concentrates for delivery to Japanese smelters on December 8, 1969.

Including \$5,000,000 preliminary exploration cost approximately \$100,000,000.00 was spent by Anvil, Federal and Territorial Governments, and the Yukon and Whitehorse railway to bring this property into production.

An additional contract has been signed for the delivery of 90,000 tons of lead-zinc concentrates annually to Germany and the concentrator is presently being enlarged at a cost of \$3.5 million to produce the increased tonnage. The contract now signed calls for an annual production of 470,000 tons of concentrates per annum.

PICTURES OF THE PAST



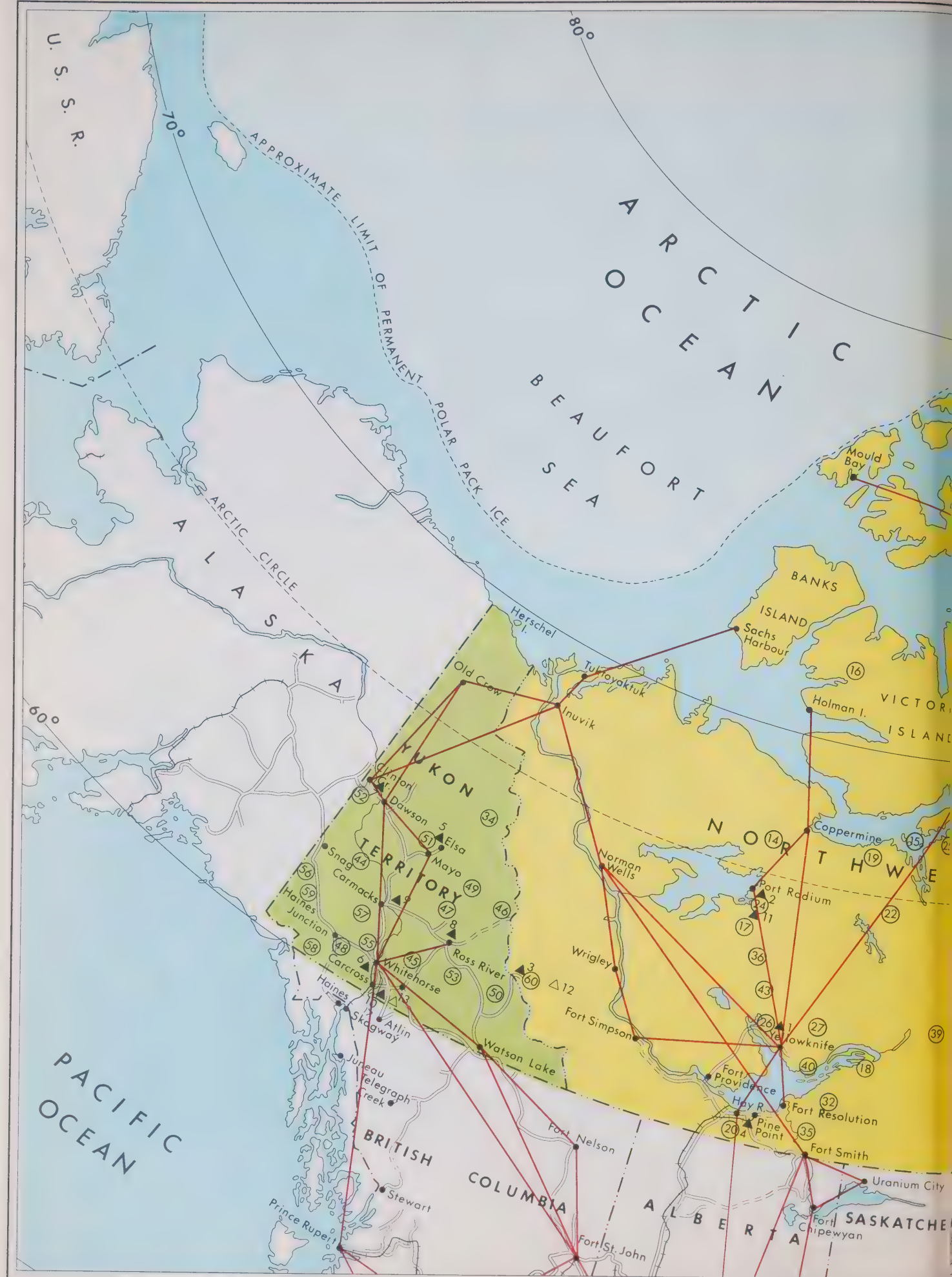
View of floatplane base, Cameron Bay on Great Bear Lake which was the location of the Mining Recorder's office, Department of the Interior - 1933.

Photo by M. Meikle



Northwest Territories Prospectors Association annual meeting to elect officers, Cameron Bay on Great Bear Lake - August 4, 1933.

Photo by M. Meikle



MINERAL EXPLORATION AND MINING - YUKON & N.W.T.

SCALE OF MILES
0 100 200 300 400

LEGEND

▲ PRODUCING MINE

△ DEVELOPING MINE

(no) AREAS OF ACTIVITY

— EXISTING ROAD

— RAILWAY

— COMMERCIAL AIR ROUTE

1 Giant Yellowknife Mines Ltd. Au

Con-Rycon Mine Au

2 Echo Bay Mines Ag Cu

3 Canada Tungsten Mining C.Ltd. WCu

4 Pine Point Mines Ltd. Pb Zn

5 United Keno Hill Mines Ltd.

Pb Zn Ag Cd

6 New Imperial Mines Ltd. Cu

7 Cassiar Asbestos Corp. Ltd. Asb

8 Anvil Mining Corp. Ltd. Pb Zn Ag

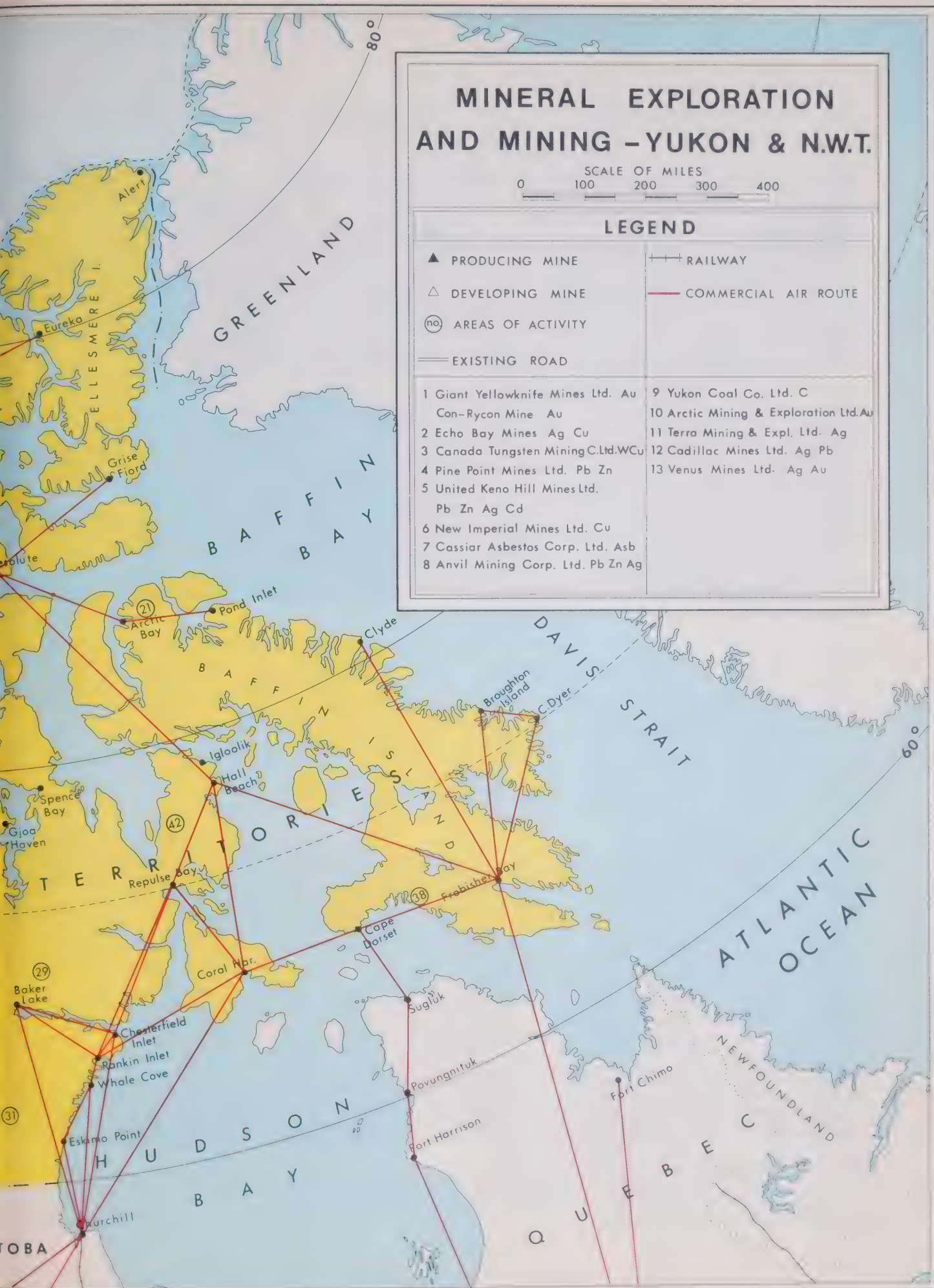
9 Yukon Coal Co. Ltd. C

10 Arctic Mining & Exploration Ltd. Au

11 Terra Mining & Expl. Ltd. Ag

12 Cadillac Mines Ltd. Ag Pb

13 Venus Mines Ltd. Ag Au



PICTURES OF THE PAST



Portaging light rigid 17 foot canoe by floatplane, Hunter Bay - 1931.

Photo by M. Meikle



Eldorado Gold Mines Ltd. property, LaBine Point - 1935.

This property was later developed by the Eldorado Mining & Refining Co. (Crown Corporation) which operated as a uranium producer until 1961 - It is now the site of Echo Bay Mines Limited.

Photo by M. Meikle

The open pit mine will produce 5,500 tons per day rising to 6,600 tons of ore per day when the concentrator expansion is completed.

The concentrates are road-hauled in 30 ton, gondola type containers to Whitehorse, a distance of 240 miles. The concentrates are then transferred to rail cars of the Yukon and White Pass Railway and hauled to Skagway, Alaska, where the concentrates are dumped into a bulk storage terminal for reloading and delivery to Asian and European markets. The Yukon and White Pass invested approximately \$10,000,000.00 in trucks, containers, railroad, terminal storage and loading facilities to handle the 1,200 tons of concentrates daily.

Asbestos

Cassiar Asbestos Corporation Limited

Location	—	50 miles northwest of Dawson
Product	—	asbestos fibre
Rate	—	3,100 tons per day
Grade	—	6 — 7% 1/16" — 1/8" fibre
Reserves	—	23,000,000 tons
Employees	—	193

Three grades of asbestos are produced at Clinton Creek mine of Cassiar Asbestos Corporation Limited and consideration is being given to production of a spinning fibre. Values for fibre are quoted F.O.B. Vancouver, B.C. where the product is distributed to customers in the United States and around the world; the value per ton of fibre averages \$100.00. The mill is now operating at better than design capacity (80,000 tons of fibre per year) and considerable improvements have been made in dust control in the crusher house and the mill.

Copper

New Imperial Mines Limited

Location	—	7 miles south of Whitehorse
Product	—	copper, gold, silver
Rate	—	2,200 tons per day
Grade	—	1.68% copper
Reserves	—	8,778,000 tons
Employees	—	180

New Imperial Mines Limited continued to feed the mill during the year from the Little Chief, Arctic Chief and War Eagle, open pits. A 15% decline, 15 feet wide and 10 feet high was collared in October between the mill and the Little Chief to initiate a plan to mine the ore below Little Chief and Arctic Chief open pits by underground sub-level caving methods.

Coal

Tantalus Butte Coal Mine

Location	—	100 miles north of Whitehorse
Product	—	coal
Rate	—	80 tons per day
Grade	—	thermal coal
Reserves	—	unknown
Employees	—	10

The Tantalus Butte Coal Mine and surrounding coal leases were purchased by Anvil Mining Corporation Limited in 1969. Production recommenced in July and the coal is picked up by concentrate gondola trucks returning empty from Whitehorse for delivery to the Anvil Mine at Faro where it is used to provide heat to dry the lead-zinc concentrates. The coal is mined by room and pillar methods from one main adit entry. The seam is several feet thick and dips steeply from surface. Ventilation is maintained by raises driven to surface at intervals on the outcrop. Indians resident in nearby village of Carmacks comprise the labour force at the mine.

MINING DEVELOPMENT

Gold — Silver

Venus Mines Ltd.

18 miles of road was completed from Carcross to Venus Mines Ltd. on the west shore of Windy Arm close to the old gold camp at Conrad, where a mill operated in the past. A feasibility report has been completed and a mill will be constructed during the winter of 1969-70 and the spring of 1970.

During 1969 a crew of 7 men completed 2,000 feet of diamond drilling, 1,300 feet of raises and 1,000 feet of lateral drifts.

The mine is being developed from two adits and a stock pile of broken ore is being established for a proposed mill tune-up by July, 1970. The ore-body contains gold, silver, lead, zinc and cadmium values with a reserve estimated to be sufficient for 5 years production at 300 tons per day.

Copper — Gold

Hart River Mines Limited

This property is located 64 miles east of Mile 52 on the Dempster Highway northeast of Dawson City. A vein of massive sulphides containing copper, lead, zinc, gold and



Baled asbestos at the Clinton Creek project ready for shipment. Each pallet consists of 20 bags, each weighing 100 pounds - August 1969.

Photo by George Allen Aerial Photos

silver values is being developed from two adits at the 3,680 and 3,880 feet elevations. The 3,880 adit cut the vein 646 feet from the portal and a program of drifting and cross-cutting for bulk samples was commenced. The lower adit has reached a distance of 218 feet from the portal. Total drifting to date is 2,300 feet while 3,000 feet of surface diamond drilling and 5,000 feet of underground drilling have been completed. It is reported that reserves of 600,000 tons grading 1.45 ounces per ton silver, 0.041 ounces per ton gold, 1.45% copper, 0.87% lead and 3.65% zinc have been established. A preliminary feasibility study is under preparation. Driving of the adits commenced in March and termin-

ated in August. 18 men were employed on the property work is expected to recommence in January 1970 following the arrival of supplies by the winter road.

EXPLORATION

At the close of the year the Yukon was experiencing a new staking rush in the Dawson Range of mountains located 150 miles northwest of Whitehorse. Over 10,000 mineral claims have been staked on a mineralized belt 50 miles wide and 150 miles long extending from near the Village of Carmacks to the junction of the Yukon and the White River.

staking activity is an expression of the wide spread interest in the Casino Silver Mines Ltd. discovery of a large deposit of low grade copper-molybdenum mineralization at the headwaters of Casino and Canadian Creeks.

Other important exploratory work continued on copper, silver, lead, lead-zinc, and nickel deposits and prospecting was carried out in all parts of the territory for all of the base metals, and also for tungsten in the eastern and northern Yukon.

Copper – Molybdenum

Dawson Range Area

The *Casino Silver Mines Limited* (44) property located at the headwaters of Canadian and Casino Creeks 150 miles northwest of Whitehorse and 12 miles south of the Yukon River was the scene of intense activity in 1969 following the discovery of a porphyry copper deposit. Prior to World War II the area was staked for its placer gold deposits. Later, the claims were found to contain scheelite. Discovery of silver-lead veins resulted in extensive underground work and surface diamond drilling from 1964 to 1967 and an airstrip was constructed as well as a 140 mile winter road from the Wash Landing on Kluane Lake.

Diamond drilling in 1967 revealed minor chalcopyrite mineralization in altered porphyritic monzonite. A geochemical survey carried out in 1968 revealed a copper-molybdenum anomaly in the vicinity of the present drilling. During 1969, diamond drill holes, comprising 20,000 feet of drilling in the period May to December, indicated the probability of a very large, low-grade copper-molybdenum deposit.

It is reported by officials of Brameda Resources Limited which at present holds a controlling interest, that inferred reserves are "1.164 billion tons at a value of \$4.05 per ton, of combined copper and molybdenum."

Dawsonmont Mining Corporation of Canada Ltd. (44) carried out reconnaissance geochemical surveys in the Kluane Lake and St. Elisa areas. The exploration emphasis shifted to the Dawson Range early in the summer and claims were staked 10 miles east of Casino's ground. Geological mapping and a geochemical survey was carried out on the claims.

Cominco Ltd. (44) carried out an area prospecting program in the Dawson Range attracted by the porphyry copper mineralization discovered by Casino; mineral claims were staked on Big Creek, 10 miles west of Mount Freegold.

Max Exploration Inc. (44) conducted an exploration program using geological reconnaissance and geochemical techniques in the general area of the Dawson Range. Claims

were staked to the southeast of Casino on Maloney Creek, based on data from a reconnaissance geochemical survey, water and stream silt sampling in the Carmacks and north Aishihik areas.

Dawson Range Syndicate (44) geologically mapped and silt sampled a northwest trending belt some 50 miles wide and 150 miles long extending from Mount Freegold to west of Stewart River. The targets were porphyry copper-molybdenum deposits of the Casino type.

Atlas Exploration Ltd. (44) moved into the area late in the season and carried out geological and geochemical reconnaissance throughout the Dawson Range. Although late to move into the area, Atlas staked large claim groups and optioned previously staked ground.

Near the end of 1969 many companies were acquiring mineral claims in the Dawson Range for the purpose of carrying out exploration programs in 1970.

Other Areas

Boswell River Mines Limited (45) diamond drilled its claims on Red Mountain, 50 miles northeast of Whitehorse. The program consisted of 10,000 feet of drilling. A scintillometer survey helped discriminate between sediments and intrusive rocks in overburden covered areas. Copper-molybdenite mineralization is present in acid intrusive rocks.

Lead – Zinc

Hudson Bay Mining and Exploration Limited (46) did preparatory work on the TOM Claims in the MacMillan Pass area improving and lengthening the airstrip, building local roads, and collaring an adit. Earlier work (1952) outlined 9,000,000 tons of 5-6% zinc and 0.8% lead. This company also carried out visual and geochemical prospecting in the MacMillan River area.

Kerr Addison Mines Ltd. (47) carried out a gravity survey and further diamond drilling on its Swim Lake deposit in the Anvil Vangorda district near the town of Faro. This Company also carried out an exploration program in the area on the south side of the Pelly River.

No increase in the 15 million tons of indicated lead-zinc ore in the Swim Lake deposit was reported. The grade is similar to that of the Anvil ore body.

Mercury Explorations Ltd. (47) carried out, early in the year, a systematic exploration program consisting of gravity surveys on mineral claims in the Anvil-Vangorda Creek area.

Atlas Explorations Ltd. (49) carried out property evaluation on claims staked during the 1968 season in the Mount Silas area, 60 miles northeast of the Anvil mine. The claims cover silver, lead and lead-zinc showings.

Geological and geochemical reconnaissance was also carried out in the Lansing area, north of MacMillan River, and along the Stewart River.

International Mine Services Ltd. (44) carried out an exploratory program consisting of regional geochemical reconnaissance and geological mapping. Several claim groups were staked and drilling was reported to have found lead-zinc mineralization.

Silver — Lead

Hyland River Mines Limited (50) have a property 12 miles west of Mile 47 on the Cantung Road. Stripping, trenching and 1,000 feet of diamond drilling during 1969 indicated a massive sulphide replacement body (galena and sphalerite with silver) 10 to 12 feet thick and 500 feet long.

Matt Berry Mines (50) carried out further geophysical work on its Francis Lake property.

Silver Spring Mines Limited (51) completed 400 feet of drifting and 180 feet of raising on its silver-lead property on the Elsa-Keno road. A limited diamond drilling program was also conducted.

United Keno Hill Mines Limited (51) did surface exploration and geochemical prospecting in the Keno, Galena Hills and Potato Hills Areas.

Silver Christal Mines Ltd. and Cro-Mur Mines Ltd. (51) carried out surface exploration and trenching on their claims in the Keno Hill area.

Connaught Mines (52) carried out bulldozer trenching, diamond drilling and geological mapping of silver-lead veins in the Sixty Mile River area west of Dawson City.

Stump Mines Ltd. (53) early in the year, completed underground exploration on claims in the Ketzia River area 120 miles northeast of Whitehorse. Following this, operations were closed down and the camp and equipment in the area sold to Trans-Yukon Mines Ltd.

Trans-Yukon Mines Ltd. (53) carried out 5,000 feet of diamond drilling on its silver-lead prospect located 4 miles south of the Stump Mine property.

Canol Mines Ltd. (53) carried out a bulldozer trenching and geological mapping program on its mineral claims in the Seagull Creek area, southeast of Ross River.

Copper

Bonnet Plume River Mines Limited (34) continued work on its 108 claim Mammouth Group, 15 miles east of Fairchild Lake and 150 miles northeast of Mayo. Work on this copper-cobalt property consisted of geological mapping, a limited amount of diamond drilling and airstrip and road construction.

New Imperial Mines Limited (55) continued exploration on its extensive holdings in the Whitehorse Copper Belt. Geological mapping was completed during the year.

Silver City Mines (56) completed 11,000 feet of diamond drilling on its White River property 18 miles south of Mile 1168 Alaska Highway. Mineralization consists of blebs and veinlets of chalcocite and native copper in amygdaloidal basalt.

Arrow Inter America (57) conducted a ground magnetometer survey on its claims immediately east of Aishihik Lake. Garnet-magnetite-epidote skarn contains local chalcopyrite mineralization.

Jackpot Copper Mines (58) did bulldozer trenching and magnetometer anomalies on a copper prospect south of Dalton Post near the Yukon-British Columbia boundary.

White River Mines (58) completed an I.P. Survey on claims (KC Group) near the White River.

Canyon City Explorations Ltd. (56) completed an I.P. Survey on 12 claims in the White River area (C.C. Group).

Kathex Mines Limited (58) carried out a geophysical program on the Johobo Mine property southwest of Hazelton Junction.

Mitsubishi (57) did minor bulldozer trenching and geological examinations on its property on west side of Aishihik Lake.

Nickel — Copper

Hudson Bay Mining and Exploration Ltd. (59) carried out 2,000 feet of diamond drilling from surface on the Wellington property on Quill Creek, 7 miles west of Mile 1111, Alaska Highway. Rehabilitation of the underground workings commenced during the year. Negotiations are presently underway to obtain markets for the possible production of nickel-copper concentrates from this property.

Tungsten

Ammax Exploration Inc. (46) continued detailed exploration of its tungsten property immediately north of MacMillan

Asbestos

Golden Gate Explorations Ltd. (48) re-examined its asbestos prospect to the east of Haines Junction. A large meter truck mounted drill was used to put down 26 holes through some 50 feet of soil and glacial till and 10 feet into red periodotite.

Arrow Inter America (56) examined an asbestos prospect near Tincup Lake, Kluane Lake, area.

Cassiar Asbestos Corporation (45) examined ultrabasic rocks in the Quiet Lake area for possible fibre occurrences.

NORTHERN ECONOMIC DEVELOPMENT BRANCH

The Branch is responsible for the management of all northern resources and for advancing the economic development of northern Canada. Its tasks are to seek out and identify all means whereby the economy of the North can be advanced at a more rapid pace, to develop a broad plan of economic progress and to recommend specific projects and policies for achieving these objectives. The Branch also undertakes feasibility studies in the interest of northern development in order to create a suitable climate of opportunity for investments. Studies include such matters as transportation, smelters, townsite planning, power studies, etc. Financial aid is also given to bring some of these projects to reality; for example, the construction of Great Slave Lake Highway was undertaken to permit the development of Pine Point Mines. The Branch is further responsible for establishing appropriate resource and economic development programs in line with the federal government's objectives and to attain these objectives the government has instituted many assistance programs to help the mineral industry in overcoming some of the high costs of operating in the North. These include the Northern Mineral Exploration Assistance Program, Prospectors' Assistance Program, Road and Airstrip Assistance Programs and Assay Services. In addition, financial support is given to organizations who assist in northern

mineral development such as Chambers of Mines and Accident Prevention Associations.

In order to discharge its functions, the Branch is subdivided into four divisions; Oil and Mineral Division, Water, Forests and Land Division; Economic Staff Division; and Administrative Services Division.

This publication details mining activity north of 60 and since the management of mining lands in this region rests with the Oil and Mineral Division the responsibilities of that Division and its mining section are described in more detail on the following pages.

The Oil and Mineral Division is responsible for:

- (a) the management and administration of Crown mineral rights in the Yukon Territory and Northwest Territories including offshore areas lying north of the line described in the schedule to Order in Council P.C. 1965-2284;
- (b) the formulation and recommendation of policies designed to encourage resource exploration and development including the terms of disposal of mineral rights;
- (c) the planning and assessment of programs designed to provide an adequate infrastructure so that the natural resources when found, can be profitably developed and delivered to market;
- (d) the evaluation of natural resource exploration and development projects to determine whether they qualify for any of the assistance programs available and/or government support in other areas;
- (e) the assessment of national fiscal policies and subsidy programs as they affect northern natural resources;
- (f) the administration of industrial safety legislations; and
- (g) representing the Department in discussions with the industries concerned and with other departments in the resource field.

Officers responsible for the administration of the above program of work are listed in the table following:

Department of Indian Affairs and Northern Development

Minister	Jean Chrétien	Ottawa, Ontario
Deputy Minister	H.B. Robinson	Ottawa, Ontario
A/Assistant		
Deputy Minister	A.D. Hunt	Ottawa, Ontario

Northern Economic Development Branch

Director	A.B. Yates	Ottawa, Ontario
Regional Director	G.A. McIntyre	Whitehorse, Y.T.
Regional Director	F.A. McCall	Yellowknife, N.W.T.

Oil and Mineral Division

Chief	H.W. Woodward	Ottawa, Ontario
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Mining Section

Administrator of Mining	B.J. Trevor	Ottawa, Ontario
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Mining Lands Unit

Supervising Mining Recorders	R.J. Simard B. Baxter	Ottawa, Ontario Whitehorse, Y.T.
Mining Recorders	F.V. Daly M. Monroe R.G. Ronaghan R.L. Williams D.W. Cairns	Ottawa, Ontario Dawson, Y.T. Mayo, Y.T. Watson Lake, Y.T. Yellowknife, N.W.T.

Inspection Services Unit

Chief Mining Engineer Resident	S. Homulos	Ottawa, Ontario
Mining Engineers	G. Needham M.L. Brown	Whitehorse, Y.T. Yellowknife, N.W.T.
Assistant Mining Engineer Mine Rescue	J. Torrington	Whitehorse, Y.T.
Superintendents	J.L. Comeau J.D. Barraclough	Yellowknife, N.W.T. Whitehorse, Y.T.

Geological Evaluation Unit

Head	A.D. Oliver	Ottawa, Ontario
Resident Geologists	D.B. Craig J. Kelly	Whitehorse, Y.T. Yellowknife, N.W.T.

Development Analysis Section

Head	A.T. Jordan	Ottawa, Ontario
Assistant Head	L. Bereza	Ottawa, Ontario

MINING SECTION

This section is responsible for the administration of mining and mineral rights (excluding oil and gas) from the acquisition of claims through to the production stage including safety in mines. The section is comprised of three units: Mining Lands, Geological Evaluation and Inspection Services and the responsibilities for their operation rest with the Administrator of Mining.

Mining Lands Unit

For administrative purposes, the Territories have been divided into seven mining districts, each of which has been allocated a Mining Recorder and supporting Staff. Each Mining Recorder is responsible for the disposition of mineral rights within his respective district in accordance with the legislation applicable. There is a Supervising Mining Recorder for each Territory, whose principle function is to ensure that uniform practices are observed in the administration of the various mining acts and regulations, and where necessary, interpretations, directives and instructions are prepared.

The districts and location of Mining Recorders' offices are as follows:

	District	Office
Yukon Territory	Mayo	Mayo, Y.T.
	Dawson	Dawson, Y.T.
	Watson Lake	Watson Lake, Y.T.
	Whitehorse	Whitehorse, Y.T.
Northwest Territories	Mackenzie	Yellowknife, N.W.T.
	Nahanni	Watson Lake, Y.T.
	Arctic and Hudson Bay	Ottawa, Ontario

Mineral claims staked and recorded North of 60 degrees latitude in 1969 with comparative figures for 1968 are tabulated below:

Yukon Territory			Northwest Territories		
District	Claims 1968	Recorded 1969	District	Claims 1968	Recorded 1969
Whitehorse	3,960	12,927	Mackenzie	43,444	10,588
Dawson	434	846	Arctic and Hudson Bay	526	8,034
Mayo	2,129	1,489	Nahanni	519	468
Watson Lake	1,880	996			
Total	8,403	16,258	Total	44,489	19,080

Inspection Services

Headed by the Chief Mining Engineer for the Yukon and Northwest Territories, stationed at Ottawa, this unit

responsible for administration and preparation of various by-laws, ordinances, rules and regulations pertaining to the mining industry in mines. In addition, the unit is responsible for Mine Rescue training and recovery operations, assay services and other technical aspects of the mining industry and provides services also in the inspection of oil well drilling rigs and certain other industrial operations North of 60°.

Rescue

There are two fully equipped Mine Rescue stations — one at Yellowknife, N.W.T. and one at Whitehorse, Y.T. A new rescue building has been erected in Whitehorse to better serve the mining industry.

The Whitehorse station is equipped with 36 Draeger B-174, 4-hour breathing units while the Yellowknife station has 24 of these units. In addition 20 self contained Draeger Self Rescuers have been purchased, ten to go to each territory. Each station is also equipped with high pressure oxygen pumps capable of pumping up to 300 atmospheres of pressure.

Sub-stations are established at remote mines and each is equipped with 6 Draeger B-174 breathing apparatus, with two oxygen cylinders.

The Mine Rescue Superintendents in addition to maintaining the central station in each Territory, travel to outlying sub-stations to inspect equipment and to conduct Mine Rescue and First Aid training.

Mining Safety — Yukon and Northwest Territories

The American standard method of recording work injuries is used in recording accidents and calculations of frequencies and severities.

Disabling injuries are those which result in death, permanent total disability, permanent partial disability or temporary total disability.

Days recorded as lost time are calendar days lost but not including the day of the accident or the day of return to work. In the case of death, permanent total disability or permanent partial disability, scheduled time charges set out in the above standard are used.

Accident Statistics — 1969

To the end of December 1969, there were 96 disabling injuries reported in the Yukon. The accident frequency for disabling injuries decreased from 51 in 1968 to 45 in 1969. Accident severity decreased from 3,439 in 1968 to 770 in 1969. "Fall of persons" was the chief cause of accidents in



Yukon Mine Rescue team - 3rd Canadian Mine Rescue Competition at Saskatoon, Saskatchewan, June 13-14, 1969. Team checking apparatus prior to competition.

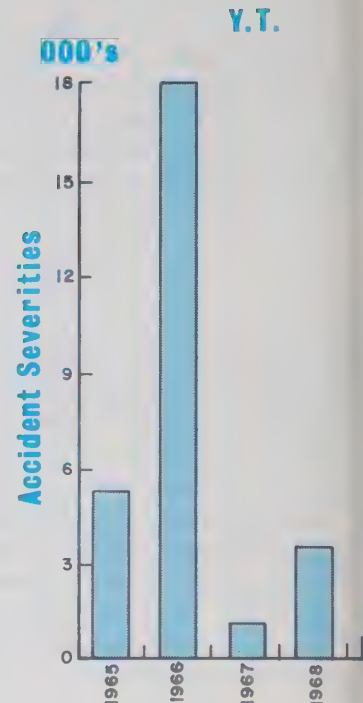
Photo by B. Trevor

MINING ACCIDENT SEVERITIES

Yukon Territory

Mine	Number of Man Hours Worked 1969	Number of Days Lost Jan-Dec. 1969	* Accident Severity Jan-Dec. 1969	* Accident Severity Jan-Dec. 1968
Anvil Mining Corp.	433,302	323	745	326
Arctic Gold & Silver Mines Ltd.	71,389	93	1,303	826
Cassiar Asbestos Corp. . . .	635,879	251	395	92
Foley Silver Mines Ltd. . . .	—	—	—	337
Mount Nansen Mines Ltd.	51,694	217	4,198	1,342
New Imperial Mines Ltd.	399,733	73	183	264
Stump Mines Ltd.	—	—	—	1,398
United Keno Hill Mines Ltd.	562,562	704	1,251	12,256
Venus Mines Ltd.	17,740	20	127	2,169
Yukon Coal Co.	10,674	4	375	—
TOTAL	2,193,647	1,689	770	3,439

* Accident Severity is number of days lost per 1,000,000 man hours.

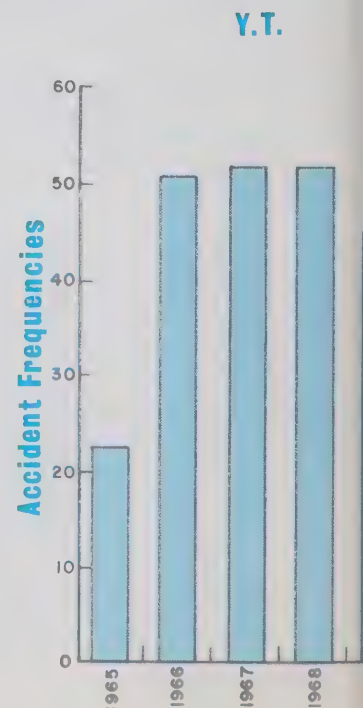


MINING ACCIDENT FREQUENCIES

Yukon Territory

Mine	Number of Man Hours Worked 1969	Number of Accidents Jan-Dec. 1969	* Accident Frequency Jan-Dec. 1969	* Accident Frequency Jan-Dec. 1968
Anvil Mining Corp.	433,302	11	25	34
Arctic Gold & Silver Mines Ltd.	71,389	4	56	63
Cassiar Asbestos Corp. . . .	635,879	18	28	22
Foley Silver Mines Ltd. . . .	—	—	—	84
Mount Nansen Mines Ltd.	51,694	7	135	133
New Imperial Mines Ltd.	399,733	24	60	55
Stump Mines Ltd.	—	—	—	111
United Keno Hill Mines Ltd.	562,562	27	48	43
Venus Mines Ltd.	17,740	3	169	241
Yukon Coal Co.	10,674	2	187	0
TOTAL	2,193,647	96	45	51

* Accident Frequency is number of accidents per 1,000,000 man hours.



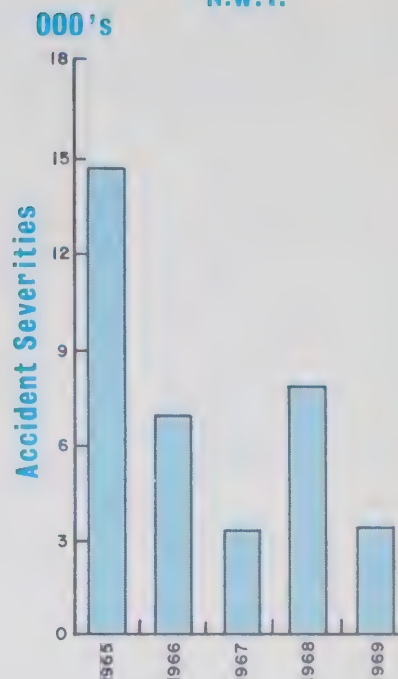
MINING ACCIDENT SEVERITIES

Northwest Territories

Mine	Number of Man Hours Worked 1969	Number of Days Lost Jan-Dec. 1969	* Accident Severity Jan-Dec. 1969	* Accident Severity Jan-Dec. 1968
La Tungsten Mining Ltd.	190,233	62	326	34,088
Rycon-Vol-Yellorex	472,394	576	1,219	14,830
Verby Mines Ltd.	63,844	80	1,253	489
Bay Mines Ltd.	263,215	165	627	336
Yellowknife Ltd.	847,671	6,633	7,825	7,835
Point Mines Ltd.	1,010,252	1,336	1,322	2,742
TOTAL	2,847,609	10,188	3,578	7,736

* Accident Severity is number of days lost per 1,000,000 man hours.

N.W.T.



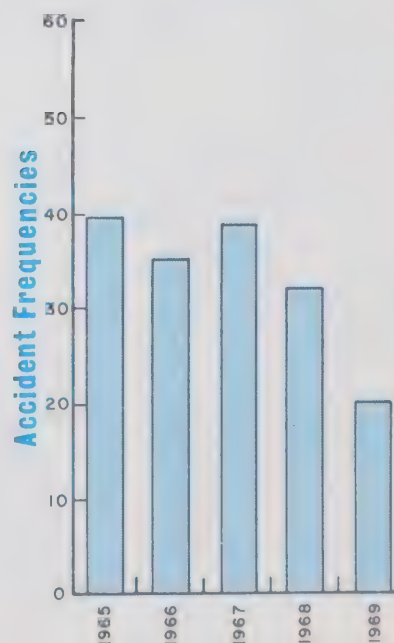
MINING ACCIDENT FREQUENCIES

Northwest Territories

Mine	Number of Man Hours Worked 1969	Number of Accidents Jan-Dec. 1969	* Accident Frequency Jan-Dec. 1969	* Accident Frequency Jan-Dec. 1968
La Tungsten Mining Ltd.	190,233	5	26	89
Rycon-Vol-Yellorex	472,394	5	11	29
Verby Mines Ltd.	63,844	4	63	30
Bay Mines Ltd.	263,215	21	80	46
Yellowknife Ltd.	847,671	14	17	34
Point Mines Ltd.	1,010,252	7	77	14
TOTAL	2,847,609	56	20	32

* Accident Frequency is number of accidents per 1,000,000 man hours

N.W.T.



CAUSES OF DISABLING INJURIES IN MINES

Yukon Territory

1969

CAUSES OF INJURIES	Anvil Mining Corp.	Arctic Gold & Silver Mines Ltd.	Cassiar Asbestos Corp.	Mount Nansen Mines Ltd.	New Imperial Mines Ltd.	United Keno Hill Mines Ltd.	Venus Mines Ltd.	Yukon Coal Co.	TOTAL
Drilling	—	—	1	—	—	—	1	—	2
Caught between two objects	—	2	—	1	1	1	—	1	6
Strain while lifting	4	—	8	—	1	2	—	—	15
Fall of persons	2	—	5	1	11	7	1	—	27
Struck by moving object	1	—	2	3	5	2	—	—	13
Foreign matter in eyes	—	—	—	—	—	—	1	—	1
Tramming cars	—	—	—	1	—	4	—	—	5
Fall of rock	—	1	—	1	2	5	—	—	9
Falling object	3	—	2	—	1	3	—	—	9
Blasting	—	1	—	—	—	—	—	—	1
Misc.	1	—	—	—	3	3	—	1	8
TOTAL	11	4	18	7	24	27	3	2	96

CAUSES OF DISABLING INJURIES IN MINES

Northwest Territories

1969

CAUSES OF INJURIES	Canada Tungsten Mining Corp. Ltd.	Con-Rycon-Vol-Yellorex	Discovery Mines Ltd.	Echo Bay Mines Ltd.	Giant Yellowknife Mines Ltd.	Pine Point Mines Ltd.	TOTAL
Drilling	—	—	—	—	1	—	1
Caught between two objects	—	—	1	1	2	4	8
Strain while lifting	—	2	—	1	1	—	4
Fall of persons	2	—	2	6	—	2	12
Struck by moving object	1	1	—	5	—	—	7
Foreign matter in eyes	—	1	1	1	3	—	6
Tramming cars	—	1	—	—	3	—	4
Fall of rock	—	—	—	1	3	—	4
Falling object	1	—	—	3	—	—	4
Blasting	—	—	—	1	—	—	1
Misc.	1	—	—	2	1	1	5
TOTAL	5	5	4	21	14	7	56

Yukon, accounting for 28% of all accidents followed by "slips while lifting" and "struck by moving objects". These were the main causes accounted for 57% of all accidents reported. There were no fatal accidents during the year in the Yukon Territory.

In the Northwest Territories, 56 disabling injuries were reported. Accident frequency decreased from 32 in 1968 to 28 in 1969, while the severity decreased from 7,736 in 1968 to 3,578 in 1969. In the Northwest Territories, "Fall of objects" and "caught between two objects" were the two main causes of accidents, accounting for 36% of all accidents reported. There was one fatal accident in 1969 compared to three in 1968. On May 28, 1969 a stope trainee was killed instantly upon being struck by falling rock in 742 stope on the 750 foot level of Giant Yellowknife Mines Limited, Yellowknife, N.W.T.

Geological Evaluation Unit

This unit is composed of an Evaluation Engineer located in Ottawa, with supporting field staff including Resident Geologists at Whitehorse and Yellowknife. The function of this unit is to provide assistance to those engaged in the mineral industry of the northern territories. It is responsible for evaluating all geological, geophysical, geochemical and other like work submitted as representation work in respect of mineral claims, and reports submitted under the Prospectors' Assistance Program and providing inspection of all work performed by participants under the Northern Mineral Exploration Program. This unit maintains a library of technical reports submitted as representation work which are available for perusal by the public once the confidential period is terminated. The unit also maintains liaison between the government agencies and private industry in connection with geological information.

Resource Development Analysis Section

This section initiates, implements and maintains policies and development programs and projects designed to stimulate the exploration for non-renewable resources in the Yukon and Northwest Territories.

The prime activities have been concerned with carrying out financial and engineering evaluations of resource developments in the Yukon and Northwest Territories where government assistance has been requested and in administering programs designed to encourage resource development in the north.

Further studies of the logistics and marketing aspects of the proposed development of Baffinland Iron Mines Limited were conducted. These were done essentially to update

earlier economic feasibility studies necessary to assess the Company's request for assistance of approximately \$32.0 million to provide a railroad, roads, airstrips, harbour facilities and a townsite.

Financial assistance for access road construction was recommended for Scurry-Rainbow Oil Limited and for airstrip construction for Stan Reynolds Guide and Outfitter, Keewatin Arctic Camp Company Limited, Terra Mining and Exploration Limited, Echo Bay Mines Limited, Triad Oil Company and Panarctic Oils Limited under the Road and Airstrips Assistance Program. A total of \$176,275 was committed to these projects in accordance with the provisions of the program whereby the Federal Government will share the costs of approved construction.

INCENTIVE PROGRAMS

Prospectors' Assistance Program

In both the Yukon Territory and Northwest Territories, a combined amount of \$60,000 is granted to aid prospectors in their search for mineral deposits. A prospector may receive up to \$900.00 each year to help finance his prospecting venture. The program has been well received since its introduction in 1962 and was instrumental in the successful location of several mineral discoveries.

Photo by B. Trevor



Northwest Territories Mine Rescue Team - 3rd Canadian Mine Rescue Competition at Saskatoon, Saskatchewan, June 13-14, 1969. Captain inspects equipment.

During 1969, the amount of \$35,728.00 was committed. Twenty-six prospectors in the Northwest Territories and twenty-five in the Yukon Territory participated in the program this year.

Northern Mineral Exploration Assistance Program

This program is designed to encourage mineral exploration activity in the Yukon Territory and Northwest Territories by providing grants of up to 40 per cent of the cost of approved exploration programs for minerals or oil and gas in the North. One hundred and forty corporate applicants have applied for assistance in one or more programs of exploratory work. Since the inception of the Program in 1967 eighty-eight applications have been approved and a total of \$2,584,884.45 has been paid in grants leaving an outstanding commitment of \$972,200.58. Moreover, payments of \$9,022,500.00 have been made towards a large program of oil and gas exploration in the Arctic Islands.

Northern Roads Program

The Northern Roads program which was approved by the Federal Government in 1965 called for an annual expenditure of \$10 million for the following 10 years in both territories. It is the first phase of a long-range 20 year program designed to bring all potential areas of resource development within 200 miles of the nearest permanent road. The policy was designed to be sufficiently flexible to allow revisions in priorities from year to year to keep pace with resource development. It also allowed for a shift in volume of construction from one Territory to another, depending on the requirements and based on northern territorial development.

Instead of placing emphasis on resource potential alone, the road program is based on a multiple concept having as its objective the creation of a broad network of road loops to serve all needs.

The total estimated Federal expenditure on northern roads for 1969-70 will be \$9,489,000 and the following is a list of major projects conducted during the year under this program:

Northwest Territories

Mackenzie Highway N.W.T. 1

The two year contract let to Western Construction and Lumber Company in the amount of \$3,086,415 for clearing 119 miles of road right-of-way and building 62 miles of subgrade is now 87% complete. In March, 1969, a two year contract was let to T.A. Klempke and Son Construction Limited in the amount of \$2,404,481 for subgrade, surface, and structures of 67 miles of road from Fort Simpson eastward. The work is continuing on this road and progressing favourably.

Yellowknife Roads

The two year contract to Freeway Construction (Northern) Limited, mentioned in the 1968 report, has now been completed. Design is underway for a new freeway to replace the existing one at Fort Providence.

Future Development Roads

Work in excess of \$400,000 was undertaken in 1969. This work consisted of 30 miles of survey and design on the section of the Fort Smith—Fort Reliance and Fort Simpson—Fort Liard roads; 60 miles of survey and design on the Dempster Highway from Fort McPherson to the intersection of the MacKenzie Highway and 69 miles north of this road to Inuvik; aerial surveys on the Ingraham Trail and aerial surveys, mapping and design on the MacKenzie Highway in the area of the intersection of the Dempster Highway.

Fort Liard Highway

A contract for clearing a right of way for 34 miles from N.W.T. 1 southwards was let to Mueller Construction in December, 1969, in the sum of \$120,330.

Yukon

Campbell Highway — Y.T. 9

This road runs from Watson Lake to Carmacks and has incorporated the Ross River—Carmacks Road with the Watson Lake—Ross River Road. All the contracts reported last year including the Bearfeed and Drury bridges have been completed. The two year contract in the amount of \$1,484,634 let to E. Lobe Contracting in May, 1969, for stockpiling materials and gravel surfacing of 142 miles of road between Ross River and Carmacks is ahead of schedule and is now 73% complete. Work is now complete on the reconstruction of 25 miles of road from Watson Lake northwards.

Whitehorse-Keno Road — Y.T. 2

This road now forms part of a route designated by the Yukon Government as the Klondike Highway which when completed, will extend from Skagway to Carcross through Whitehorse, Carmacks, Stewart Crossing and westward to Dawson.

In 1969, contracts totalling more than \$1,200,000 were completed with the upgrading of a 50 mile section of road between Whitehorse and Carmacks to trunk road standards. This completes the upgrading of the road between the two points.

Stewart Crossing — Dawson Road

This road is now part of the Klondike Highway. Work in excess of \$320,000 was completed in 1969 to upgrade

les of the central section of the road, construction of edge approaches and installation of guiderails.

Boundary Road

The three year contract let to Western Construction in the amount of \$2,585,869 for grading 38 miles of road has now been completed. Work amounting to \$50,000 was completed in 1969 including work on the ferry landing camps at Dawson.

Dempster Highway — Y.T. 11

A two year contract to Liard Construction Limited in the amount of \$1,795,888 for subgrading 45 miles of the central section was awarded in June, 1969. The work is ahead of schedule, and is now 40% complete.

Control Road

Work in excess of \$339,000 was completed in 1969 to replace bridges over Sydney and Dodge Creeks, road construction, and miscellaneous work.

Future Development Roads

Aerophotography and mapping costing \$160,000 was completed on various segments of the proposed Dempster Highway. Highway location surveys were completed on miles 60 - 78 and 123 - 167.

State Roads

In addition to road and airstrip assistance which is administered by the Federal Government, \$100,000 is

available in each Territory each year for the construction of low class roads to provide temporary seasonal or year-round access in connection with any natural resource development project. The program is administered by the Commissioner of each Territory. Construction is the responsibility of the individual or company concerned and costs incurred for such roads may be shared up to a maximum of 50% of the cost.

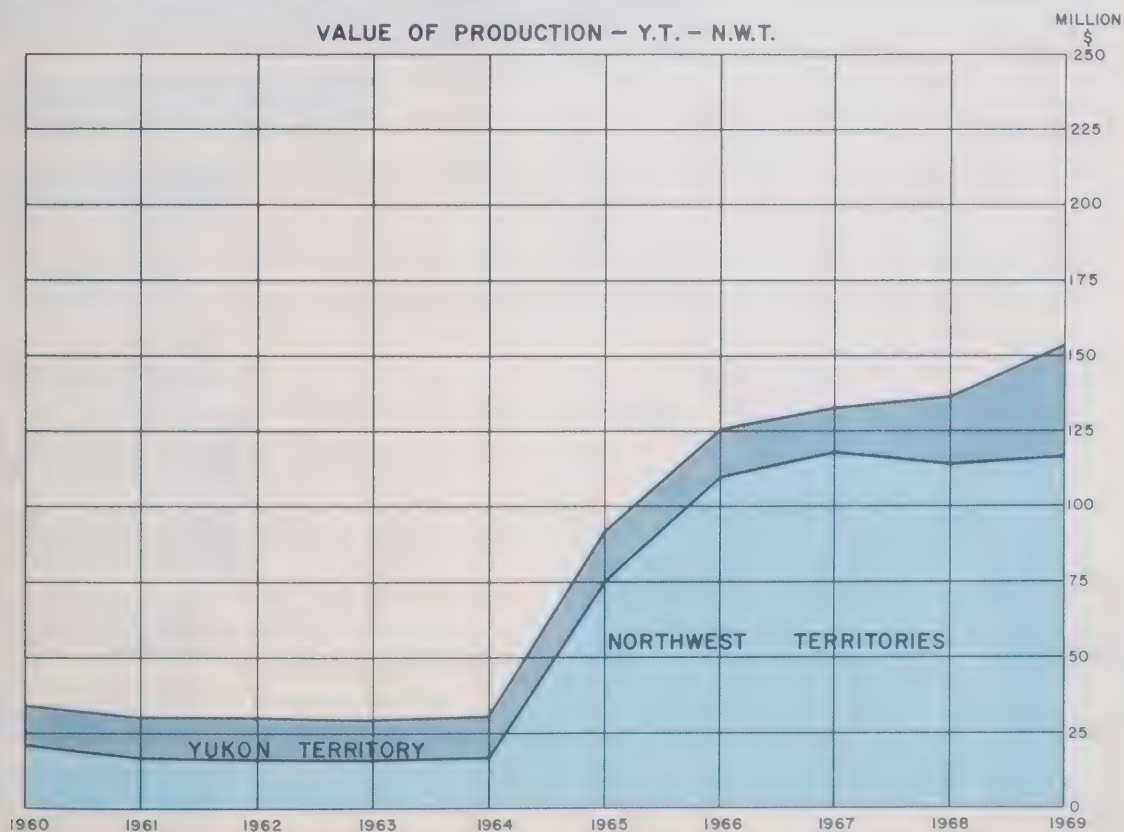
Nine applications in the amount of \$39,860.70 for tote road assistance were received covering oil, mining, agriculture and tourist enterprise in the Northwest Territories in 1969. As of December 31, 1969 \$19,214.30 had been paid out. In the Yukon, 21 applications for tote trail assistance were processed up to 17 November, 1969 and \$32,261.08 paid to applicants. \$75,222.58 has been allotted to other applicants.

Assay Service

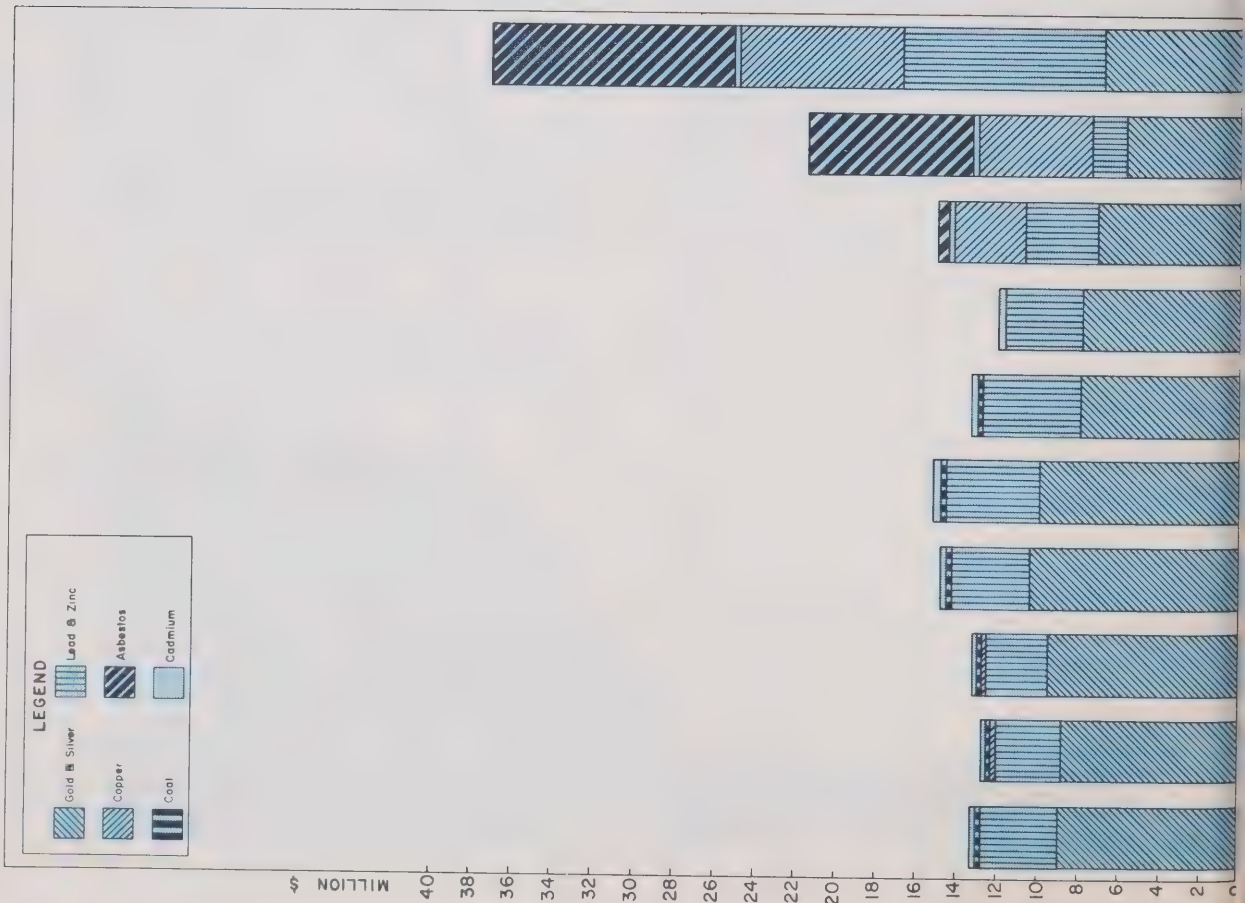
The Government Assay office at Yellowknife carried out approximately 2,576 assays during 1969. Free assays performed either under the provisions of the Prospector's Assistance Program or as provided for under the Canada Mining Regulations, amounted to 795 determinations at a value of \$2,068.50.

In the Yukon Territory, 50% of the cost of ten assays per prospector per year, is paid by the Federal Government and during 1969, approximately 656 assays were paid for at a cost of \$3,695.40 to the Federal Government.

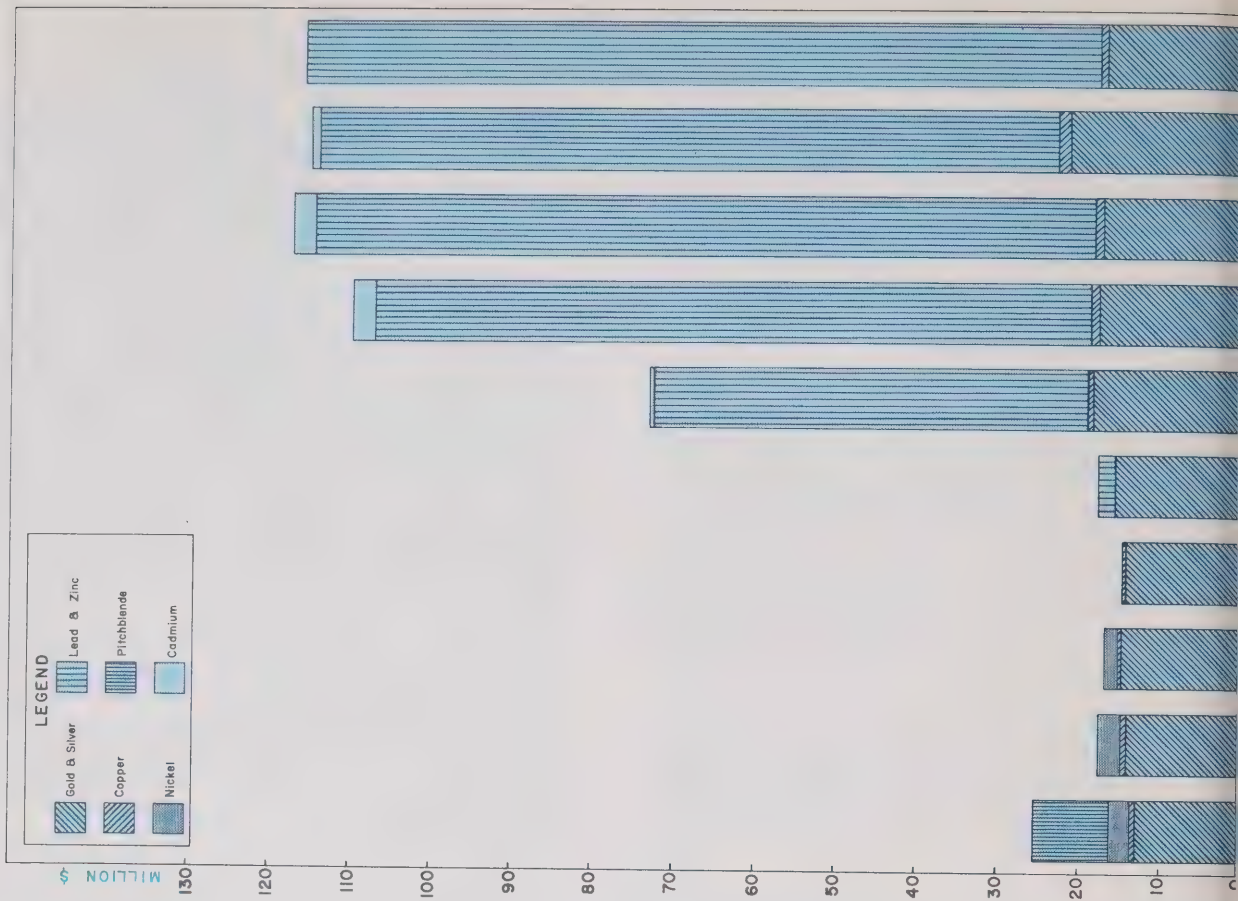
VALUE OF PRODUCTION — Y.T. — N.W.T.



VALUE OF MINING PRODUCTION - YUKON



VALUE OF MINING PRODUCTION N.W.T.



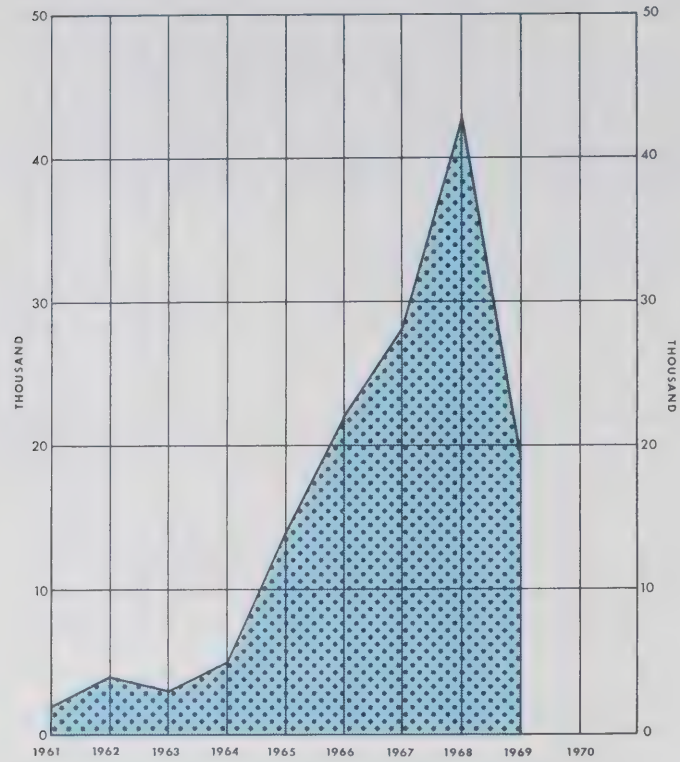
Mineral	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969(a)	Cumulative Total (b)
Gold \$	14,194,631	14,449,028	14,974,924	14,609,250	15,586,182	17,071,580	15,990,133	14,356,476	13,285,459	12,935,473	279,707,686
ounces	418,104	407,474	400,292	387,000	412,879	452,479	424,029	380,304	352,306	343,116	
Silver \$	70,659	73,419	84,814	107,216	91,312	1,490,754	2,325,407	3,429,755	8,677,365	3,911,170	21,776,923
ounces	79,473	77,890	72,802	77,468	65,223	1,064,824	1,662,192	1,980,228	3,751,563	2,026,513	
Copper \$	315,016	270,440	194,928	10,281	.....	354,342	672,065	538,077	833,169	550,920	4,374,522
pounds	1,040,000	926,480	628,801	32,638	.....	942,400	1,496,805	1,131,126	1,732,160	1,071,200	
Nickel \$	2,669,645	2,604,789	1,503,837	.....	.....	.....	.....	.....	.....	.....	12,850,205
pounds	3,813,778	3,409,410	1,801,002	.....	.....	.....	.....	.....	.....	.....
Lead . . . . . \$	.....	.....	.....	.....	823,279	25,677,695	31,472,562	35,665,535	33,636,984	31,037,000	158,313,055
pounds	.....	.....	.....	.....	6,125,588	165,662,547	210,659,720	254,753,820	250,275,180	205,000,000	
Zinc . . . . . \$	.....	.....	.....	.....	1,111,016	28,596,474	57,128,344	60,852,900	57,504,129	67,012,000	272,204,863
pounds	.....	.....	.....	.....	7,840,620	189,380,626	378,333,400	419,964,800	407,830,700	440,000,000	
Pitchblende(d) \$	9,231,698	.....	.....	.....	.....	.....	.....	.....	.....	.....	79,477,897
pounds	1,077,211	.....	.....	.....	.....	.....	.....	.....	.....	.....
Cadmium . . . . . \$	.....	.....	.....	.....	.....	516,635	2,769,372	2,551,920	774,060	.....	6,611,987
pounds	.....	.....	.....	.....	.....	185,840	1,073,400	911,400	271,600	.....
TOTAL \$	26,481,649	17,397,676	16,758,503	14,726,747	17,611,789	73,707,480	110,357,883	117,394,663	114,711,166	115,446,563	835,317,138

YUKON TERRITORY

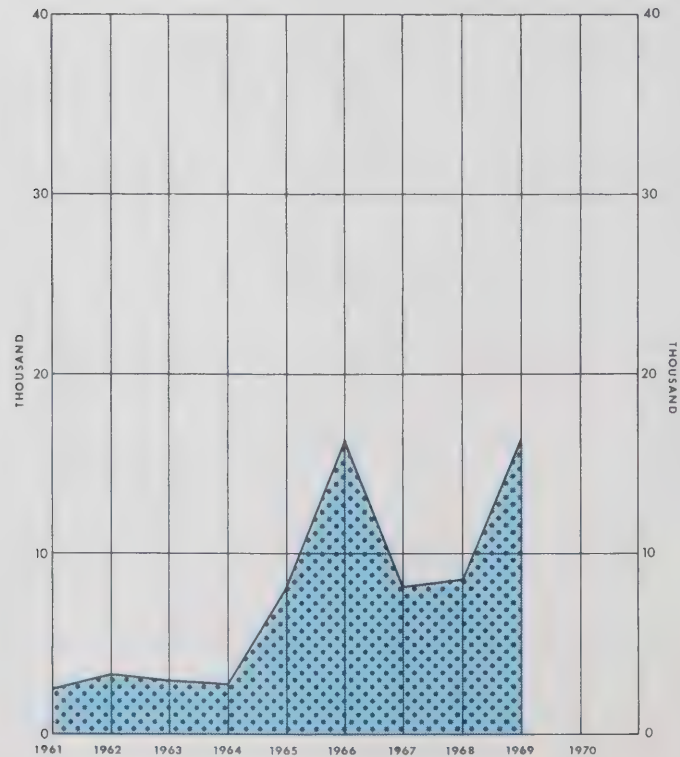
Mineral	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969(a)	Cumulative Total (c)
Gold \$	2,652,004	2,371,494	2,050,255	2,084,215	2,183,611	1,698,975	1,639,103	675,725	911,338	991,700	266,991,787(c)
ounces	78,115	66,878	54,805	55,211	57,844	45,031	43,466	17,900	24,167	26,305	
Silver \$	6,416,956	6,538,897	7,551,814	8,450,755	7,894,196	6,462,393	5,868,217	6,701,756	4,806,384	5,770,808	138,825,572
ounces	7,217,361	6,937,086	6,482,244	6,106,037	5,638,712	4,615,995	4,194,580	3,869,374	2,077,987	2,990,056	
Lead \$	2,166,638	1,712,198	1,615,980	1,867,647	2,744,235	2,766,953	2,386,684	2,141,959	970,629	4,663,120	60,959,939
pounds	20,286,871	16,769,815	16,290,125	16,978,607	20,418,415	17,851,309	15,975,125	15,299,709	7,221,940	30,800,000	
Copper . . . . . \$	.....	257,098	132,990	.....	.....	.....	.....	3,409,779	5,097,157	8,084,127	19,692,846
pounds	.....	880,773	429,000	.....	.....	.....	.....	7,167,919	10,597,000	15,718,700	
Coal \$	97,156	114,221	115,198	123,675	98,150	85,626	46,390	15,791	.....	.....	2,567,132
tons	6,470	7,703	7,649	8,231	7,229	8,801	5,670	1,912	.....	.....
Zinc \$	1,789,287	1,528,100	1,438,554	1,514,520	1,855,512	2,000,396	1,729,027	1,373,151	748,206	5,201,045	39,686,669
pounds	13,402,899	12,137,418	11,888,876	11,850,706	13,094,653	13,247,653	11,450,510	9,476,545	5,306,429	34,150,000	
Cadmium \$	206,604	228,296	231,328	326,124	428,399	386,192	306,336	265,997	147,716	243,600	5,843,211
pounds	145,496	142,685	134,493	135,885	132,222	138,918	118,735	94,999	51,830	70,000	
Asbestos . . . . . \$	.....	.....	.....	.....	.....	.....	.....	406,371	8,684,125	12,701,400	21,791,896
tons	.....	.....	.....	.....	.....	.....	.....	2,260	63,592	88,000	
TOTAL \$	13,328,645	12,750,304	13,136,119	14,366,936	15,204,103	13,400,535	11,975,757	14,990,529	21,365,555	37,655,800	556,359,052

(a) Preliminary Figures (b) Cumulative Total — 1932 to December 31, 1969 (c) Cumulative Total — 1886 to December 31, 1969 (d) Figures for years 1932, 1943, to 1953 not available.

MINERAL CLAIMS RECORDED — NORTHWEST TERRITORIES



MINERAL CLAIMS RECORDED — YUKON TERRITORY



activities

1970



north
of 60

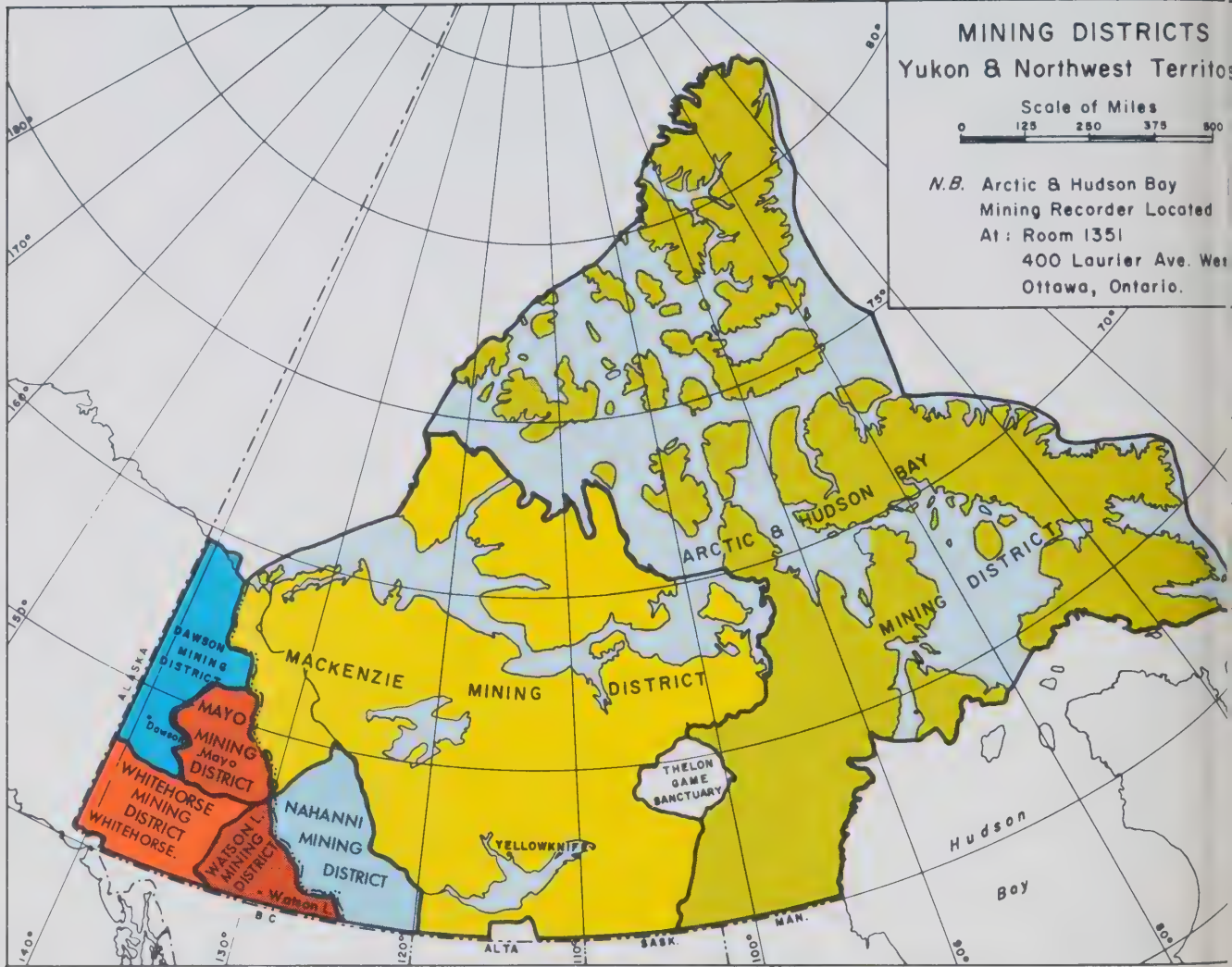
mines and minerals



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MINES & MINERALS NORTH OF 60

MINING ACTIVITY IN THE YUKON

AND

THE NORTHWEST TERRITORIES

An annual publication issued under the authority of the Honourable
Jean Chrétien, P.C., M.P., B.A., LL.L. Minister of Indian Affairs and
Northern Development.

Northern Economic Development Branch. Department of Indian
Affairs and Northern Development — Ottawa

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Introduction

Mining activity in the Northwest Territories in 1970 continued to be concentrated in the Mackenzie District with all production coming from, and all mining development taking place in, the area 80 miles east of Yellowknife to the Yukon boundary. Several small high grade deposits of silver, lead and nickel were being developed for production in 1971. Bulk samples of niccolite have been shipped to France and Germany for metallurgical testing to determine the feasibility of shipping out hand-cobbed nickel ore from small high-grade deposits in the Great Slave Lake, East Arm area of the territories.

Exploration activity continued in the Eastern Arctic on prospecting Permit areas for which exploration rights were granted in 1969 and 1970. Fifty-three permits were issued in 1970, bringing the total number of permits in good standing to 127, covering approximately 19.4 million acres of mining lands. The required work expenditure on this acreage under the terms of the permits amounted to approximately \$2.91 million during 1970.

In the Yukon Territory, exploratory activity was again concentrated in the Dawson Range area following the discovery of a large low-grade copper molybdenum deposit near the Casino-Canadian Creek headwaters in 1968. Many major companies are reviewing a year of intensive exploratory work which included geophysical surveys, geological surveys and diamond drilling, with the owners of the original discovery conducting a preliminary feasibility study.

The search for copper, nickel, lead and zinc continued in wide-spread areas and development plans for the copper-nickel deposit near Mile 1111 on the Alaska Highway were announced. Production is scheduled to begin early in 1972.

The total value of production from the two territories exceeded \$200 million, an increase of 32 per cent over that in 1969. The year 1971 promises to be another record-breaking year with an anticipated value of production exceeding \$230 million.



Material & equipment being loaded into Hercules aircraft for shipment to Northern resource development projects.

Photo courtesy Pacific Western Airlines
Edmonton, Alberta

NORTHWEST TERRITORIES

PRODUCING MINES

Mineral production in the Northwest Territories for 1970 as reported by the Dominion Bureau of Statistics was valued at \$124,004,060. This is a 5 per cent increase over the 1969 figure of \$118,185,520.

The six producing mines, two open pit and four underground, treated approximately 4,500,000 tons of ore and employed a total work force of 1,400. This represented an over-all production rate of nine tons of ore per man per day. Employment in producing mines accounted for 14 per cent of the total work force in the Northwest Territories and, with an additional 800 men employed in the exploration and mine development phase, 24 per cent of the work force was directly employed in the mining industry. A further estimated 25 per cent of the work force is employed in several service or allied industries supporting the mining industry.

Gold

Giant Yellowknife Gold Mines Ltd.

Location	— 1.5 miles north of Yellowknife
Product	— Gold
Rate	— 1,160 tons per day (including ore from adjoining Supercrest and Lolor properties).
Tons milled	— 422,606
Grade	— 0.69 ounces per ton
Reserves	— 1,144,500 tons (December 31, 1969)
Employees	— 420

The production of ore at Giant Yellowknife Gold Mines Ltd. increased by about 7 per cent over that in 1969, however, because of a small decrease in grade and lower milling price for gold, the dollar value of production declined by 10 per cent. 1,160 tons per day were milled during the year, with 800 tons coming from the Giant ore bodies and the remainder from the Supercrest and Lolor properties, which

adjoin and are interconnected with the Giant workings. All ore from Giant, Supercrest and Lolor is transported by underground haulage to the Giant "C" shaft, a five-compartment shaft located near the mill. The lowest level in the shaft is at 2,000 feet.

Supercrest Mines Ltd.

Location	— 1.5 miles north of Yellowknife and adjoining the Giant Mine
Product	— Gold
Rate	— approximately 150 tons per day
Tons Milled	— included with Giant figures
Grade	— 0.69 ounces per ton
Reserves	— 129,000 tons (December 31, 1969)
Employees	— operated by Giant

The Supercrest property consists of 24 mineral claims adjoining the Giant mine and interconnected with the Giant workings on the 575, 750 and 1,000-foot levels. All ore is transported by underground haulage to Giant's "C" shaft. This property is operated jointly by Giant Yellowknife Mines Ltd. and Akaitcho Mines on 50-50 basis with Giant having the management contract. The 1,100 foot shaft is used as a ventilation and service shaft for the combined operations.

Lolor Mines Ltd.

Location	— 1.5 miles north of Yellowknife and adjoining the Giant Mine
Product	— Gold
Rate	— approximately 100 tons per day
Tons Milled	— included with Giant tonnage
Grade	— 0.66 ounces per ton
Reserves	— 340,000 tons (December 31, 1969)
Employees	— operated by the Giant Mine

This property, consisting of six mineral claims, adjoins the Giant mine and is 87½ per cent owned by Giant Yellowknife Mines Ltd. The workings are connected with the Giant workings on the 425 foot level and all ore is transported by underground haulage to "C" shaft.

Con-Rycon-Vol Mine

Location	— 1.5 miles south of Yellowknife
Product	— Gold
Rate	— 525 tons per day
Tons Milled	— 147,505
Grade	— 0.67 ounces per ton
Reserves	— Not available
Employees	— 238

The workings of this mine, operated by Cominco Ltd., connect several adjoining properties and all ore is transported

by underground haulage to the Con C-1 shaft. Cominco holds the following interest in the respective properties, Con Mine 100 per cent, Rycon Mine 75 per cent and the Vol Mine 66.7 per cent. Cominco also has an option on another adjoining property, Yellorex, giving a 50 per cent share of all profits after expenses. The Yellorex property has been connected with the Con workings on the 2,300-foot level.

Extensive underground development work was completed in 1970 with the sinking of the C-2 winze from the 4,900 to the 5,600 foot level in the vicinity of the C-1 shaft, which is down to the 2,300 foot level. Ore and waste passes and loading pockets have also been completed.

Exploratory drifting from the C-2 winze began late in 1970 and will continue throughout 1971.

Engineering studies are in progress to solve a complicated ore handling problem. Some thought is being given to the possibility of an underground concentrator with concentrates being pumped to the surface and tailings being used for back-fill.

Lead-Zinc

Pine Point Mines Ltd.

Location	— South shore of Great Slave Lake, 50 miles east of Hay River, N.W.T.
Product	— zinc and lead
Rate	— 10,500 tons per day
Tons Milled	— 3,708,242
Grade	— 9.9 per cent combined lead-zinc
Reserves	— 41,800,000 tons (December 31, 1969)
Employees	— 520

Pine Point owns more than 1,000 claims in this area extending over a length of 25 miles. Several open pits are operated. Production in 1970 averaged 10,500 tons per day treated in the concentrator for a total of 3,708,242 tons, plus approximately 80,000 tons of direct-shipping high grade ore.

To reduce transportation costs from the largest open pit, Pyramid, special trailers are used with the 50-ton haulage trucks. Large stock piles of ore of varying grades are maintained near the primary crusher for optimum control of mill grade and tonnage and to assure continuous milling regardless of any local conditions that may hamper open pit operations.

An underground decline shaft was collared in November to begin mining the M-40 orebody. This is a relatively deep high grade orebody. Costs and efficiency data from this test

mining operation will determine the feasibility of operating other deep ore occurrences in this area.

Silver-Copper

Echo Bay Mines Ltd.

Location	— Great Bear Lake
Product	— silver-copper
Rate	— 100 tons per day
Tons Milled	— 37,761
Grade	— 65 ounces silver per ton; 2 per cent copper
Reserves	— unknown
Employees	— 102

Echo Bay Mines Ltd. operates a small high grade silver property on Labine Bay on the eastern shore of Great Bear Lake. Two products are produced, a silver jig concentrate and a copper flotation concentrate with a high silver content.

During 1970 a new winze was sunk to establish five new levels, and exploratory drifting and development work on the new levels will continue in 1971. If downward continuity of ore is verified by this underground exploratory work the mine should have many years of profitable operation.

Access to the property is mainly by air using float planes in the summer and ski-equipped planes in the winter. An all-weather airstrip is maintained at Glacier Lake about five miles south east of the property. During the winter, bulk freight is brought in by trucks over a winter trucking road. Concentrates are shipped out by air and truck to Hay River as back-haul. However, the bulk of the concentrates are shipped by barge across Great Bear Lake and up the Mackenzie River to Hay River for onward transportation on the Great Slave Lake Railway.

Silver-Bismuth

Terra Mining and Exploration Co. Ltd.

Location	— 40 miles south of Great Bear Lake
Product	— silver-bismuth-copper
Rate	— 150 tons per day
Tons Milled	— 31,713
Grade	— not available
Reserves	— not available
Employees	— 61

Terra Mining and Exploration Co. Ltd. operates a small underground mine located on Rainey Lake, 40 miles south of Great Bear Lake. Entrance to the workings is by a decline shaft driven on a 17 per cent grade and ore haulage is by

poptram. The mill has a capacity of 300 tons per day, at the current milling rate is 150 tons per day. The mill is reported to be treating ore containing approximately 10 ounces of silver per ton and one per cent copper. Bismuth may also be recovered but, to date, no bismuth production has been reported.

Milling operations were suspended during February, March and April of 1970 due to a fire that destroyed the crushing and screening unit. During this period underground development and stope preparation work continued.

Access to the property is mainly by aircraft, using boat-equipped planes in the summer and ski-equipped aircraft during the winter. Bulk freight is brought in by trucks over a winter trucking road. Barge transportation is also used from the property via Great Bear Lake and the Mackenzie River system.

Tungsten-Copper

Canada Tungsten Mining Corporation

Location	— 125 miles north of Watson Lake, Y.T.
Product	— tungsten
Rate	— 450 tons per day
Tons Milled	— 176,100
Grade	— 1.61 per cent tungsten, 0.45 per cent copper
Reserves	— 733,823 tons (December 31, 1969)
Employees	— 66

Canada Tungsten Mining Corporation operates an open pit mine near the headwaters of the Flat River in the Nahanni Mining District. Mining is conducted during the summer months and ore is stock piled to permit year-round milling. Development work included the evaluation by diamond drilling of a low-grade scheelite-bearing chert zone below the present orebody. Concentrates are shipped to a leaching and washing plant in North Vancouver to upgrade the product for shipment to world markets.

MINING DEVELOPMENT

Five mines in the Northwest Territories were being developed in 1970, two silver-lead properties in the Great Bear Lake area, two nickel properties on the north shore of Great Slave Lake, and a silver-lead property in the Nahanni River area.

Silver-Lead

Cadillac Explorations Ltd. is developing a silver-lead property on Prairie Creek in the Nahanni Mining District.

Penarroya Canada Limitée, a wholly owned subsidiary of Société Minière et Métallurgique de Penarroya of Paris, France, has taken an option on this property on which exploratory work began in 1966. In 1970, 36,800 feet of underground development work, 15,000 feet of diamond drilling and detailed geological studies were completed for a total expenditure of approximately \$2.5 million. The results indicate a deposit of 2,000,000 tons of ore grading 13 per cent zinc, 11 per cent lead and five ounces silver per ton. Engineering evaluation studies are underway, and Penarroya recently announced that it will continue development under option terms which include bringing the mine into production and the construction of a 1,000 tons per day mill.

Norex Resources Ltd. situated in the Camsell River area, 40 miles south of Great Bear Lake, constructed a small test mill on its property during the summer of 1970. The coarse and fine ore bins were constructed with local round timber. A 12" x 18" jaw crusher is followed by a small shorthead cone crusher and a rotary impact mill. The circuit also includes two Wilfey tables and a jig. Capacity of the mill is about two tons per hour.

An eight-ton bulk ore sample was shipped out over the winter road in March and a small tonnage of mill concentrates has also been shipped to British Columbia for smelter tests.

The mine consists of an open cut into the side of a hill terminating in a short adit. The ore is mucked out with a slusher and loaded by ramp to a truck for haulage to the mill. At year end, high grade ore was being handpicked from the stock-pile for milling, and a 6,000 foot diamond drilling program was continuing to prove lateral and vertical continuity of the vein and to investigate the copper bearing gossan southeast of the open cut.

Silver Bay Mines, which operates the old Camsell River Silver property, mined and stock-piled part of the high grade vein above the adit and between the raises. A small mill has been purchased and will be shipped to the property when the winter road is ready in January.

Arrangements are being made to consolidate ownership of the claims and take the property to lease. Current operations are being conducted by Federated Mining Corporation Ltd. and there is a report that Canadian Javelin Ltd. may take over this and other neighbouring properties.

Nickel

Copper Pass Mines Ltd. situated on Sachowia Point on the north shore of Great Slave Lake continued to hand-cob its high grade niccolite showing. One open pit was completed in

the spring and another started in September. A total of 250 tons of high grade hand-cobbed niccolite ore was shipped over the winter road in March and 200 tons by barge in October. The ore grade is reported to be 35 per cent nickel, but the final results have not been received from the refinery in France which is treating the test shipments.

An adit was collared at lake level but no decision has been made to proceed with underground development. Operations in the second open pit will be resumed in 1971.

Jason Explorers Ltd. operated, until the end of the year, a small open pit on Blanchet Island on Great Slave Lake. The ore was hand-cobbed and bagged at the face of the open-cut on the side of a steep hill and high-lined down to the valley and from there transported to the shore by tractor. Ninety tons were shipped to France in the spring and 250 tons in October for metallurgical testing. The grade of the first shipment was reported as 10.5 per cent cobalt and 11.5 per cent nickel. Results for the second shipment are expected to be comparable.

EXPLORATION

In spite of tight money, uncertain markets and difficult operating conditions, mineral exploration continued at a

steady pace throughout the Northwest Territories in 1970. The more active areas included the Mackenzie Mountains where the search for base metals, tungsten and silver was stepped up in 1970; the Hackett River area where Cominco's work on Bathurst-Norsemine's lead-zinc property created much interest; the greenstone belts north of Yellowknife over which 500 miles of aerial geophysics were flown; the Camsell River areas's silver prospects; the East Arm of Great Slave Lake which was prospected for uranium, nickel and copper; the Keewatin District where holders of 77 permits searched for uranium, nickel and base metal prospects; Melville Peninsula, a promising area for iron and base metal deposits; and northern Baffin Island where exploration for lead, zinc and base metals continued. Approximately 60,000 claims and 127 prospecting permits were in good standing at the end of the year.

Copper

Coppermine River, Bathurst Inlet and Victoria Island Area

The intense activity by private companies seen in these areas in 1968 and 1969 was much reduced in 1970. *Coppermine River Ltd.*, *Hearne Coppermine Explorations*



Steel barge being loaded with mobile house units, material and equipment for resource development projects along the Mackenzie River, Northwest Territories.

Photo courtesy Northern Transportation Company Limited

Ltd., *Grandroy Mines Ltd.* and *Muskox Mines Ltd.* did very little additional work in 1970.

September Mountain Copper Mines Ltd. (17) completed a drill program on its properties near Amco Lake in the Coppermine basalts.

Giant Yellowknife Mines Ltd. (17) did reconnaissance mapping and general prospecting over the ACE claim group near Ace Lake, 50 miles south of Coppermine.

Ballinderry Explorations Ltd. and *Cadillac Explorations Ltd.* (18) drilled on a 100-foot-long gossan zone in Yellowknife volcanics, 12 miles south of the Hood River.

Western Electronics and Engineering Ltd. in partnership with *Canadian Delhi Oil Ltd.*, *Asamera Oil Corp. Ltd.* and *Canadian Reserve Oil and Gas Ltd.* (19) conducted a comprehensive survey including prospecting, geological mapping, ground EM surveys and ground magnetometer surveys over 1,743 claims west of Arctic Sound on Bathurst Inlet. Basalts of the Coppermine River Series and dolomites of the Parry Bay Formation were examined for significant copper mineralization.

Borealis Exploration Ltd. (18) completed an evaluation of three permit areas in the vicinity of the Hood River. Prospects located by aerial geophysics in 1969 were mapped and examined by ground EM surveys in 1970.

Yellowknife Area

Shield Resources Ltd. and *Numac Oil and Gas Ltd.* (20) conducted aerial EM and magnetic surveys over a portion of the Beaulieu River greenstone belt, 80 miles northeast of Yellowknife. Geological mapping and ground geophysics were completed over the most interesting anomalies and drill targets were selected for 1971.

The Keevil Mining Group and *Hearne Coppermine Explorations Ltd.* (20) also conducted air and ground geophysical surveys along the Beaulieu River and were in the process of acquiring land as the year ended.

Vorthgate Exploration Ltd. (20) did general prospecting and geological mapping in the Yellowknife volcanics along the south shore of Camsell Lake. This belt had been examined and portions drilled by the same company in 1966 and 1967.

International Obaska Mines Ltd. (20) drilled a sulphide prospect, two miles north of the northeast end of McCrea Lake.

Trans-Canada Resources Ltd. and *Moresby Mines Ltd.* (20) prospected and mapped the MD and MC claim groups near Upper Ross Lake.

Polar Star Mines Ltd. (21) completed a ground EM survey over portions of the CAN claims in the Winter Lake area, 40 miles north-northeast of Yellowknife.

Freeport Oil Company (Alberta) Ltd. (22) flew 1,673 line miles of EM and magnetic surveys in the Indin Lake area during the spring of the year. Ground follow-up was conducted and several of the anomalies staked.

East Arm Area

Giant Yellowknife Mines Ltd. (23) completed detailed geological mapping of the G and GAP groups on Wildbread Bay in the East Arm of Great Slave Lake. Chalcopyrite and bornite are associated with quartz carbonate veins which cut the limestone and dolomite of the Utsingi Formation.

Bevco Mines Ltd. (24) conducted a general prospecting program on its base metal prospects along the south shore of Great Slave Lake.

David Minerals Ltd. (25) optioned the FD claims, a copper prospect on Salkeld Lake.

Mr. R.G. Perrier (51) completed a drill program of the Bay claims on the Pethei Peninsula.

Eastern Arctic

Penarroya Canada Limitée (26) conducted a comprehensive prospecting program in the southeastern Keewatin. Several claim groups were recorded over base metal showings in greenstone belts.

Yellowknife Bear Mines Ltd., *Pacific Petroleum Ltd.*, *Chieftain Development Corp. Ltd.*, *Blue Crown Mining Ltd.* and *Imperial Oil Enterprises* (27) continued their program of IP surveys, EM surveys, geological mapping, geochemistry and prospecting over five permits near Nueltin Lake. Copper prospects discovered during 1970, are to be drilled in 1971.

Giant Yellowknife Mines Ltd. (26) re-examined its holdings in the southern Keewatin at Spi Lake (DEE Group) and on the Ferguson River (TORIN Group).

Fort Reliance Minerals Ltd., *Redstone Mines Ltd.*, *More Mines Ltd.*, *Nahanni Mines Ltd.* and *Ensign Oils Ltd.*, partners in the *Rankin Nickel Syndicate* (28) completed an airborne geophysical survey and commenced a ground

follow-up program involving geophysics and geological mapping over three permits and 531 claims in the Rankin Inlet-Baker Lake areas of the Keewatin. Copper and/or nickel mineralization is the target.

Aquitaine of Canada Ltd. (29) began a massive exploration effort over 23 permit areas covering the southern third of the Melville Peninsula. Airborne EM and Magnetometer surveys were flown and ground follow-up was commenced. In addition, Aquitaine examined base metal showings discovered in 1969 north of Baker Lake.

Other Areas

Cerro Mining Co. of Canada Ltd. (30) optioned *Redstone Mines Ltd.* copper prospects near the Redstone River and began a comprehensive exploration and development program in the area. In 1970 geochemical surveys and geological mapping were completed. The company has announced drilling plans for 1971.

Trans-Canada Resources Ltd. and *Moresby Mines Ltd.* (31) prospected and mapped portions of the RED claims at

Hunter Bay, Great Bear Lake. A reconnaissance geochemical survey was also completed over the claim group.

Quint Holdings Ltd. (32) were drilling at the year's end on its STAR and COMET claims which contain a mineralized quartz vein containing good values of copper. The company also conducted an airborne radiometric survey over the adjacent FOX claims.

Central Arctic Explorations Ltd. (33) conducted a ground EM survey and a drilling program on a sulphide zone in acid and intermediate volcanics on the north shore of Muskox Lake.

Lead — Zinc

Some of the most promising work completed in the Territories during 1970 was on lead-zinc prospects. Penarroya and Cadillac have announced production plans and Cominco's work on its prospects near the Hackett River and



Steel barges freighting supplies to settlements along the Mackenzie River, Northwest Territories.

Photo courtesy Northern Transportation Company Limited

on Little Cornwallis Island and Texas Gulf Sulphur's work on its Strathcona Sound property indicate sizeable tonnages of ore-grade material.

Pine Point Area

Cominco Ltd. and *Pine Point Mines Ltd.* (34) conducted IP surveys and test drilling on their properties around Pine Point and east to the Little Buffalo River.

Buffalo River Exploration Ltd. (34) (Newconex Holding Ltd., Central Patricia Gold Mines Ltd. and Conwest Exploration Ltd.) is conducting feasibility studies on its orebody in the Pine Point area which contains an estimated 1,350,000 tons grading 13 per cent combined lead-zinc.

New Territorial Uranium Mines Ltd. (34) conducted a drilling program in the spring on the MACBETH Group optioned from Rich Point Mines, 14 miles west of Pine Point.

Conwest Exploration Co. Ltd. (34) conducted an IP survey over parts of the MY claims, 15 miles west of the town of Pine Point.

Hackett River Area

Cominco Ltd. (35) conducted a reconnaissance drilling and exploration program on a 952-claim group optioned from *Bathurst Norsemines Ltd.* (formerly Bathurst Inlet Mining Corp., Norsemines Explorations Ltd. and Atlin Yukon Mining Ltd.) in the Hackett River area, 45 miles southwest of the head of Bathurst Inlet. Aerial and ground geophysical surveys were run, geological maps prepared and a total of 10,804 feet of drilling was completed. Significant intersections of silver, zinc, lead and copper were reported from two zones. Several geophysical anomalies remained to be drilled at the close of the season.

D.E. Arden (35) conducted a prospecting program and a ground EM survey over the T claims bordering Cominco's option to the south.

Ice Station Resources Ltd. (35) also completed ground EM and magnetic surveys over the ZED claim group, south of Cominco's Hackett River property, and trenching and general prospecting over the SA claims.

Mackenzie Mountains

Penarroya Canada Limitée conducted a reconnaissance prospecting and geochemical survey over the area surrounding the Cadillac Explorations Ltd. property on Prairie Creek.

Mr. John Goodall (36) completed a preliminary geological investigation and a ground EM survey over the JET claims on

Old Fort Island in the Mackenzie River, 22 miles south of Wrigley.

Arctic Islands

Texas Gulf Sulphur Co. Inc. (37) had a small survey party at work on its Strathcona Sound property this summer. Production plans for this property have not been announced.

King Resources Co. (37) continued the examination of its 7 permits on the Borden Peninsula, north of Baffin Island. A crew of 40 men worked from a base camp at Magda Lake. Geological mapping, geochemical surveys and diamond drilling were completed over areas of interest defined the previous year. Some 1,940 claims were staked around King's permit areas by *PCE Explorations*, possibly as a result of King's work in 1969.

Cominco Ltd. (38) completed detailed surface mapping of 2 lead-zinc prospects on Little Cornwallis Island optioned from *Bankeno Mines Ltd.* A gravity survey was run over the showings and preparations made for a drilling program in 1971.

Bayou Petroleums Ltd. (now Canada Northwest Land Ltd.) and *New Park Mining Co.* (38) prospected 2 permit areas, one on Cornwallis Island, the second on Bathurst Island.

Canadian Gridoil Ltd. (39) (now Ashland Oils Canada Ltd.) conducted a geochemical survey over 6 prospecting permits on Somerset Island.

Other Areas

Cominco Ltd. (20) conducted a limited drill program on the claims near Turnback Lake, 55 miles east-northeast of Yellowknife.

Silver

Great Bear Lake Area

Considerable interest was maintained in the silver possibilities of the Echo Bay Group throughout the year. *Echo Bay Mines Ltd.*, *Terra Mining and Exploration Ltd.*, *Norex Resources Ltd.* and *Federated Mining Corporation Ltd.* all produced silver or made test shipments from their properties in 1970.

Terra Mining and Exploration Ltd. (11) completed detailed geological mapping of its claim groups west of the Camsell River. Considerable underground drilling was done to extend the silver veinlets to depth.

Republic Mines Ltd. (32) drilled five holes totalling 840 feet on its HD claims southwest of the Terra mill.

Conwest Exploration Co. Ltd. (32) mapped the MJ and MKB claim groups which lie south of *Norex Resources* property in the Camsell River area.

Gateway Ventures (32) conducted a geochemical survey over the MINT claims, one mile north of Clut Lake.

Quintana Mines Ltd. (32) conducted a ground EM and Mag survey over the AS claims on Clut Island in Clut Lake (the old IL claims). Some geological mapping was done at the same time.

Pollution Control Engineering Ltd. (32) prospected and staked 124 claims in the Contact Lake area.

Echo Bay Mines Ltd. (31) examined and drilled a copper and silver prospect near Spud Bay on Great Bear Lake.

Silver Bay Mines Ltd. (32) did preliminary prospecting and trenching over several new claim groups in the vicinity of Balachey Lake and the Camsell River.

Other Areas

A consortium of Messrs B. Linton, P. Linton, H. McClure and P. Risby (40) discovered and drilled a silver-copper prospect at the junction of the Godlin and Ekwi Rivers, 85 miles south-southwest of Norman Wells.

Gold

Yellowknife Area

Northbelt Yellowknife Mines Ltd. (41) continued its investigation of the PA and VARGA claims north of Giant Yellowknife Mines. A photogeological study was completed and petrographical and laboratory studies are continuing in an attempt to relate the surface geology to ore observed underground.

Duke Mining Ltd. (42) completed 10,485 feet of drilling on its TA claims in the Buckham Lake area, 52 miles east of Yellowknife, from August 1969 to January 1970. The drilling results were encouraging and additional drilling was underway at the close of 1970.

J.R. Woolgar (42) drilled 3 holes totalling 356 feet on his GLEN claims, a gold prospect on Pensive Lake.

Sturdy Mines Ltd. and *Talisman Mines Ltd.* (20) conducted a ground EM and Mag survey over the NUT and TIP claims on Lac du Rocher.

Hidden Lake Gold Mines Ltd. (42) continued development work on its property, 20 miles northeast of Yellowknife.

Uranium

Mining and oil companies continued their search for new uranium deposits throughout the Territories in 1970. The sediments of the East Arm of Great Slave Lake, Montgomery Lake and the Hurwitz Group continued to be favoured targets but uranium was reported from veins and fractures within the basement rocks in the Baker Lake area and from the predominately granitic terrain northeast of Fort Smith.

District of Keewatin

Falconbridge Nickel Mines Ltd. (43) completed a drilling program on the property of Enex Mines on Kinga Lake. The company was studying the uranium potential of the Padlei Formation, a conglomerate at the base of the Hurwitz Group.

Denison Mines Ltd. with *Lakehead Mines Ltd.*, *Roman Corporation Ltd.* and *Argosy Mines Ltd.* (43) conducted a drilling program through Hurwitz Group and Montgomery Lake rocks about 15 miles south of Padlei. At the same time, additional geological mapping and scintillometer surveys were completed over Hurwitz Group sequences.

The Dynamic Group of Companies (44) continued a vigorous program of exploration on their permits and claims east of Baker Lake. Three zones were drilled, one on Christopher Island in Baker Lake, one four miles north of Christopher Island and a third on the Kazan River by the Kazan Falls. Uranium mineralization was observed at all three locations. Three new permit areas were examined, first by airborne geophysics and then by detailed mapping and geophysical surveys on the ground. Further work is contemplated for 1971.

Aquitaine of Canada Ltd. (45) completed over 20,000 feet of diamond drilling on two uranium prospects near the south-east end of Amer Lake.

Husky Oil Ltd. (26) completed airborne EM and radiometric surveys within their two permit areas about 20 miles west of Tavani. Ground parties prospected for uranium and base metals on these permit areas in the vicinity of Daly Bay.

Other companies actively involved in exploration in the District of Keewatin include *Atlantic Richfield Co.*, *Bluemont Minerals Ltd.*, *Canadian Homestead Oils Ltd.*, *Canadian Export Gas and Oil Ltd.*, *Canada Northwest Land Ltd.*, *Canadian Delhi Oils and Republic Resources Ltd.*

East Arm Area

Vestor Explorations Ltd. (46) from September 1969 to September 1970 acquired 980 mineral claims within the East

ern region of Great Slave Lake; 160 claims are situated on the Simpson Islands, 609 are near Snowdrift, and 211 are near Fort Reliance. All claims cover rocks of the Sossan Group. To date, a total of 10 zones of uranium mineralization have been located within the conglomerates and sandstones of this formation. During 1970 geological and scintillometer surveys, trenching and bulk sampling were completed over several of the more promising showings on North Simpson Island. A drill program is to begin early in 1971.

Imperial Oil Enterprises (46) conducted a ground radiometric survey and a program of geological mapping over two claim groups totalling 230 claims on Union Island and the south shore of the East Arm of Great Slave Lake.

Quebec Minerals Ltd. (46) conducted reconnaissance radiometric surveys in the general area of the East Arm.

Great Plains Development Co. of Canada Ltd. (46) spent a few weeks at selected sites within the East Arm examining ground prospects discovered by an aerial radiometric survey in 1969.

Nonacho Lake — Fort Smith Area

Canadian Superior Exploration Ltd. (25) completed 5,751 feet of exploratory drilling on the KAY claims on the east side of Hjalmar Lake.

Cominco Ltd. (47) staked 150 claims between Tsu Lake and Little Deskentlata Lake over a high radiometric anomaly found by the Geological Survey of Canada in 1969. The area has since been flown with the company's own scintillometer and magnetometer and ground geophysics and mapping has been completed over much of the claim block. Cominco Ltd. also investigated a second radiometric anomaly on the Nahabun River.

Northwest Exploration Co. Ltd. (48) investigated the radiometric anomaly discovered by the Geological Survey in the vicinity of Leland Lakes.

Arranger Research Ltd., (25) as a result of aerial scintillometer surveys completed in 1969, sent a crew to examine areas of the Nonacho sub-province.

Prospectors were active in the East Arm and Nonacho Lake areas during 1970. Several old prospects were restaked and a few new discoveries were reported.

Other Areas

Acroll Oil and Gas Ltd. (32) conducted an airborne radiometric survey over the REX claim group in the Camseil River area.

Jason Explorers (49) continued its investigation of the KR claims near Slemon Lake. In 1970, trenching and general prospecting were done as a result of airborne and ground scintillometer surveys completed in 1969.

Nickel

Artillery Lake-Hanbury River Area

This area (50) attracted few parties during the 1970 season. Several companies completed work on their claims and then withdrew. The lack of any major find in the 1969 season is the most obvious reason for the decline in activity.

In January and February, *Acroll Oil and Gas Ltd.* completed a ground magnetic survey over its MC, SNO, JAP, SAP and SIL claim groups.

Giant Yellowknife Mines Ltd. completed a program of shallow drilling on its properties.

Great Slave Lake Area

Copper Pass Mines Ltd. (15) The company, in partnership with *Pechiney Development Ltd.*, conducted reconnaissance geological surveys and magnetometer and scintillometer surveys over its GOGO claim group in addition to its mining. Several diamond drill holes were put down on these claims and in the CP group, four miles to the northeast of the main showings.

Jason Explorers (16) in partnership with *Ugine Kuhlmann* of France, in addition to continuing development work on its cobalt-nickel showing on Blanchet Island, actively prospected the property from May to October. Geologists systematically examined the contact between a granodiorite sill and the underlying sediments for copper or cobalt stain. Magnetometer and scintillometer surveys were carried out along the contact and geochemical surveys were done in the valley below. A drilling program examined the main showing and one other. Several minor occurrences of copper and cobalt mineralization were noted.

National Nickel Ltd. (51) had a party at work on nickel prospects between Sachowia Point and Taltheilei Narrows.

Niccolite Mines Ltd. (42) continued prospecting and trenching operations on the NC and MAPLE groups covering a gabbroic intrusion, 60 miles southeast of Yellowknife.

Rolling Hills Copper Mines Ltd. (41) drilled one 350 foot hole through a gabbro dyke, five miles north of Yellowknife, to test the feature for nickel values.

Other Areas

Trans-Canada Resources Ltd. and *Moresby Mines Ltd.* (17) prospected and mapped the OXO and TOC claim groups on the west side of the Muskox Intrusion.

Jason Explorers (16) examined its ground on the east side of the intrusion.

King Resources Ltd. (52) conducted reconnaissance geological and geophysical surveys over five permits and 398 claims covering basic and ultra-basic rock units between Committee Bay and the Hayes River. *Cominco Ltd.*, *Falconbridge Nickel Mines Ltd.* and *Aquitaine Co. of Canada Ltd.* also had parties in this area.

Tungsten

At least four groups had reconnaissance prospecting programs in the Mackenzie Mountains last summer. Targets were tungsten, lead, zinc or copper mineralization. Cathro and Associates of Whitehorse were hired by *Lacanex Mining Co.*, *Imperial Oil Enterprises*, *Standard Oil of British Columbia* and *Capricorn Ventures Ltd.* to conduct a prospecting program in this area. *Spartan Explorations* also had a prospecting crew at work in the central Mackenzie Mountains

during the summer. Two smaller groups worked from Yellowknife and Hay River doing aerial reconnaissance of the eastern Mackenzie ranges, from the B.C. border to the headwaters of the Arctic Red River.

Other

Borealis Explorations Ltd. (53) continued its program of geological mapping and bulk sampling of iron prospects located on Melville Peninsula. Reserves of 2.6 billion tons averaging 35-40 per cent iron are indicated on the western side of the peninsula. A further 1.1 billion tons grading 25-30 per cent iron are indicated in five separate zones on the eastern side of the peninsula.

Gemini Minerals Ltd., *Fortune Harbour Exploration Ltd.* and *Le Marchant Investments Ltd.* (54) staked 205 claims over a bentonite prospect north of Inuvik.

Northgate Exploration Ltd. (55) conducted an airborne EM and Magnetometer survey over 504 claims centred over a gravity high, 10 miles south of Darnley Bay.

Some interest was shown during the year in the coal reserves of the Mackenzie Mountains (56).



White Pass ore concentrate truck returning to Whitehorse from the Anvil Mine a distance of 240 miles along the Campbell Highway.

Photo courtesy of Yukon & White Pass Route

YUKON TERRITORY

PRODUCING MINES

There are six producing mines in the Yukon, three open pit and three underground operations, that treated 3,818,804 tons of ore with a total work force of 1,200. This represents a production rate of 8.7 tons per man per day. Employment in producing mines accounts for 15 per cent of the total work force. In addition, another 700 are employed in exploration and development which means that the mining industry accounts for 23.7 per cent of the total work force in the Territory. Indirectly, the mining industry provides employment to a further estimated 25 per cent of work force in service or allied industries.

The producing mines include gold-silver, silver-lead, lead-zinc, copper, coal and asbestos properties. All ore with the exception of the coal is upgraded in concentrators and then the concentrates are shipped to world markets by road to railhead at Whitehorse and by rail to tidewater at Skagway, Alaska.

The value of mineral production in the Yukon increased from \$35,402,563 in 1969 to \$79,642,350 in 1970.

Gold-Silver

Venus Mines Ltd.

Location	— 18 miles southeast of Carcross
Product	— gold, silver, lead, zinc and cadmium
Rate	— 300 tons per day
Tons Milled	— 23,267 (4 months operation)
Grade	— 0.39 ounces gold and 11.55 ounces silver per ton, 2.58 per cent lead, 1.67 per cent zinc and 0.093 per cent cadmium
Reserves	— proven — 110,000 tons, probable 81,000 tons
Employees	— 50

Milling at this property commenced in September 1970 with an average through-put of 254 tons per day. The mill

produces three concentrates, lead, zinc and pyrite-gold. The zinc concentrate contains one ounce of gold and 30 ounces of silver per ton and 2.5 per cent cadmium and the lead concentrate contains seven ounces of gold and 270 ounces of silver per ton and 0.5 per cent cadmium. At year-end the pyrite circuit was not yet in operation.

The first active mining development at this property was started in 1904 by Col. J.H. Conrad and in 1908 the first concentrator in the Yukon was constructed on Windy Arm to work the Venus No. 2 mining claim. At this time 500 people lived in the nearby city of Conrad. All operations were suspended in 1912. Following the acquisition of additional claims, Venus Mines Limited was incorporated in 1966 to develop and bring the property into production.

Silver — Lead — Zinc

United Keno Hill Mines Ltd.

Location	— 31 miles northeast of Mayo
Product	— silver, lead, zinc, cadmium
Rate	— 270 tons per day
Tons Milled	— 92,535
Grade	— 28 ounces silver per ton, 4.5 per cent lead, 4.4 per cent zinc and 0.05 per cent cadmium
Reserves	— 100,000 tons (December 31, 1969)
Employees	— 275

This Company is the oldest producer in the Yukon operating several underground mines. The mill is situated at the Elsa property. The Elsa and Calumet mines provide most of the 270 tons per day millfeed with some development ore from the Husky mine.

The No Cash mine that was the scene of an underground fire in 1966 has now been reopened and development work has begun.

Exploratory surface overburden drilling as well as underground diamond drilling was conducted in search of new veins. A drill sampling program of old tailings in the area was also carried out.

Anvil Mining Corporation

Location	— 130 miles northeast of Whitehorse
Product	— lead, zinc, silver
Rate	— 6,600 tons per day
Tons Milled	— 1,066,222
Grade	— 9.22 per cent combined lead-zinc, 1.2 ounces silver per ton
Reserves	— 63,000,000 tons (December 31, 1969)
Employees	— 370

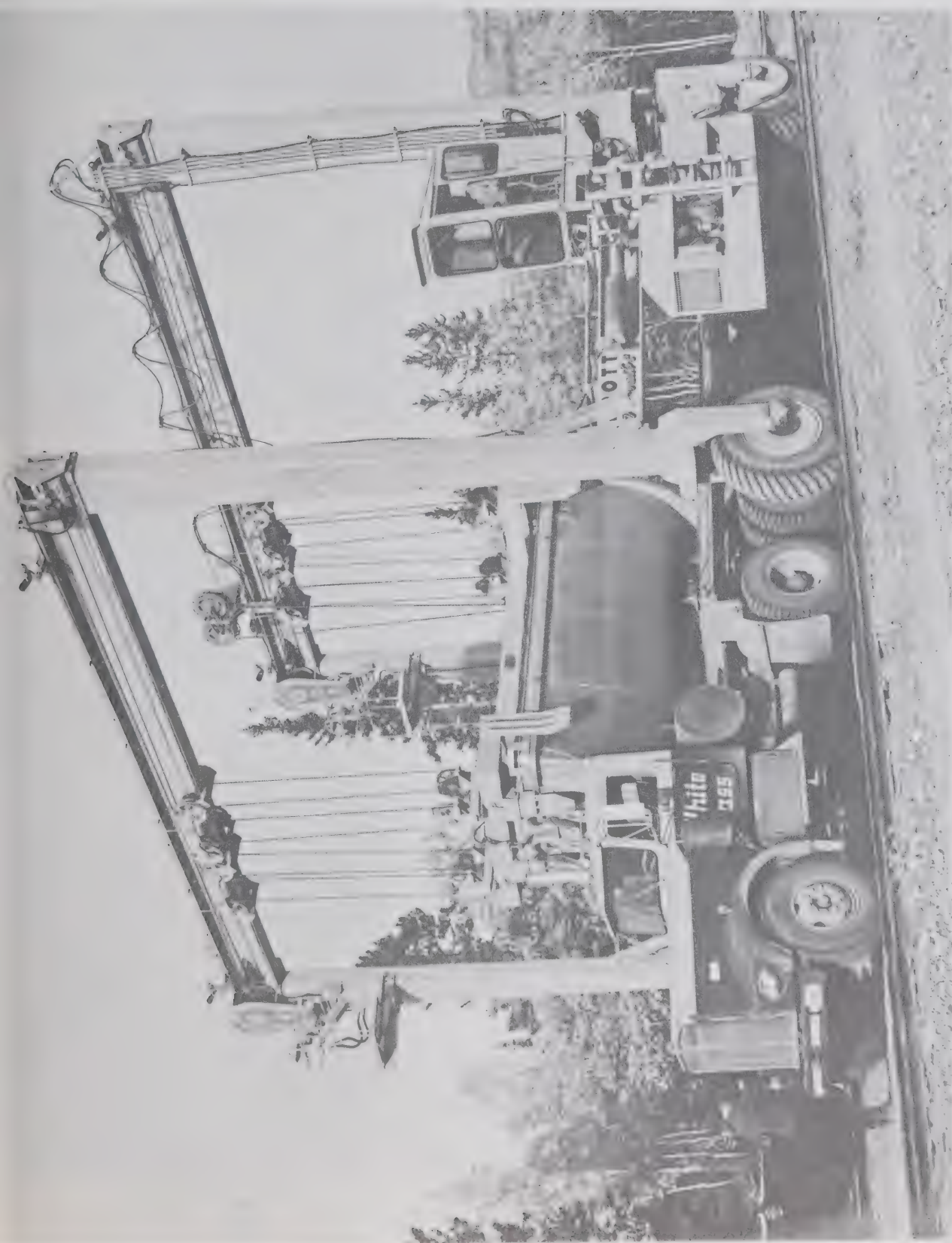


Photo courtesy of Yukon & White Pass Route

At Ulu, five miles south of Whitehorse, Yukon, a concentrate truck pulls in and the gondola container, which holds 30 tons, is transferred from the truck to a railway flat car by the Grott Gantry for railway trip to Skagway, Alaska.

Mill modifications have been completed at this property, increasing mill capacity from 5,500 to 6,600 tons per day. The additional 90,000 tons per year of lead-zinc concentrates will be sold to Metallgesellschaft A.G. of West Germany.

Sixty-five-ton dump trucks are used to haul ore from the open pit to the mill and gondola type containers are used to haul concentrates to railhead at Whitehorse, a distance of 240 road miles. The containers are transferred to railway cars at Whitehorse for shipment to tidewater at Skagway, Alaska.

Asbestos

Cassiar Asbestos Corporation Ltd.

Location	— 50 miles northwest of Dawson City
Product	— Asbestos fibre
Rate	— 4,800 tons of ore per day
Tons Milled	— 1,358,072
Grade	— 7-8 per cent fibre
Reserves	— 23,000,000 tons (December 31, 1969)
Employees	— 200

Production at this property has been increased from 80,000 tons to 110,000 tons of fibre per year. The grade of ore milled improved from 6-7 per cent to 7-8 per cent chrysotile fibre thus accounting for part of the increase in fibre production. In addition, a spinning fibre was added to the range of products produced.

Ore is crushed at the pit site and transported by bucket line to the mill. Asbestos fibre is bagged in 100-pound bags and baled on pallets each consisting of 20 bags. It is trucked to railhead at Whitehorse, then shipped by rail to tidewater at Skagway, Alaska.

The nearby Clinton Creek townsite has been completed with school facilities to Grade 9, medical services, a shopping centre and a laundry. The airport runway was lengthened and Clinton now has scheduled air service by Great Northern Airways which links it with Old Crow and Whitehorse, Y.T. and with Inuvik, Northwest Territories.

Copper

New Imperial Mines Ltd.

Location	— 7 miles south of Whitehorse
Product	— copper, silver, gold
Rate	— 2,300 tons of ore per day
Tons Milled	— 868,632
Grade	— 1-2.5 per cent copper
Reserves	— 9,000,000 tons (December 31, 1969)
Employees	— 250

Milling at this property continued at 2,300 tons of ore per day with the production coming from the War Eagle pit, nine miles from the mill. A haul road was completed to the Gem pit, 6 ½ miles south of the mill. This pit has been stripped and prepared for production when the War Eagle pit is mined out early in 1971.

A decline shaft being driven towards the Little Chief orebody, where there is an indicated 5,000,000 tons of 2 per cent copper ore, has now reached a distance of 2,500 feet. Diamond drilling from this decline has proven an additional 500,000 tons of ore. Drill stations have also been cut to assess the downward extensions at the Big Chief and Middle Chief ore bodies.

Plans are also well advanced for sinking a vertical shaft and a sinking contract will be let early in 1971. The circular shaft will be 1,200 feet deep and a friction wind hoist will be used for hoisting ore. Main access and servicing of the underground workings will be through the decline shaft.



Surface diamond drilling was also conducted on the Bear Cub and Keewenaw zones to further assess these zones.

Coal

Tantalus Butte Coal Mine

Location	— Carmacks, Y.T.
Product	— coal
Rate	— 80 tons per day
Tons Mined	— 10,076
Grade	— Thermal coal
Employees	— 14

This coal mine is being operated by Anvil Mining Corporation working a four day week and using 12 native Indian employees. The coal, which is used by Anvil for drying concentrates, is back-hauled to the Anvil mine in the gondola type containers. During the year, the main entry was advanced 100 feet north in a 10 foot high seam of coal which dips 60° west.

MINING DEVELOPMENT

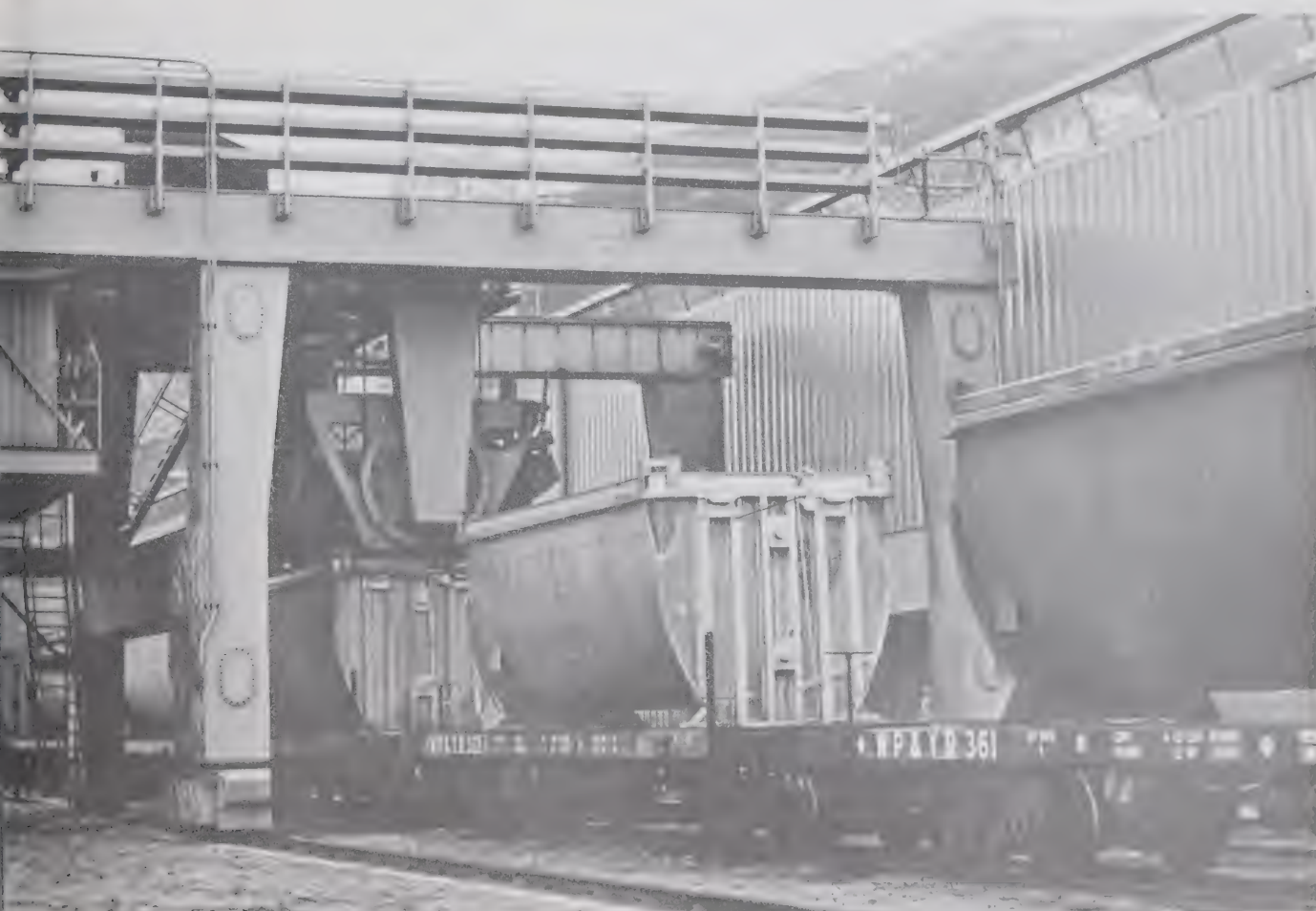
At the close of 1970 there were two properties in an advanced stage of development, one a nickel-copper deposit in Kluane Lake area and the other a lead-zinc-silver deposit at Macmillan Pass on the Yukon - Northwest Territories boundary.

Nickel-Copper

Hudson-Yukon Mines Ltd.

Location	— 10 miles west of Mile 1111, Alaska Highway.
Product	— Nickel, copper
Rate	— 600 tons per day (proposed)
Grade	— 2.04 per cent nickel, 1.42 per cent copper
Reserves	— 738,000 tons (December 31, 1969)
Employees	— 40

Hudson Bay Exploration and Development Company announced early in the year that negotiations had been completed for the sale of nickel-copper concentrates from its property at Quill Creek, known as the Wellgreen mine.



At Skagway the containers are lifted from the flat cars, projected into the storage building and concentrates are dumped. The storage building which is 750 feet long and 150 feet wide is capable of storing 100,000 tons of concentrates.

Photo courtesy of Yukon & White Pass Route

Earlier work had established reserves of 750,000 tons of ore grading 2.04 per cent nickel and 1.4 per cent copper.

Rehabilitation of underground workings and new development work, including an 800-foot shaft, has been contracted to Versatile Mining Services Ltd.

At the mine site construction of the powerhouse, mine dry and ore and waste bins were completed, except for the installation of machinery, by year-end.

At the mill site, which is 10 miles from the mine at Mile 1010 on the Alaska Highway, foundations for the mill and other buildings were nearing completion. Production is planned early in 1972 and concentrates will be sold to Sumitomo Metal Mining Company of Japan.

Zinc-Lead-Silver

Hudson Bay Exploration and Development Co. Ltd. carried out extensive drifting, 6,000 feet on one level, during 1970 on its Tom claims in the Macmillan Pass area. Diamond drill stations were provided and underground drilling will continue throughout the winter.

Previous work at this property established 5 million tons of mineralization with a grade of 16 per cent combined lead-zinc and 2.73 ounces of silver per ton.

EXPLORATION

The single most important stimulus in 1970 for mining exploration activity in the Yukon Territory was the discovery in 1969 of a major copper-molybdenum deposit of the porphyry type, on the property of Casino Silver Mines Limited in the Dawson Range. With some 20 helicopters servicing major programs and numerous individuals and partnerships exploration activity was concentrated in this area. The greater portion of exploration expenditures was made by major companies or their joint ventures and subsidiaries, with a much smaller proportion being made by individuals and partnerships. In addition to the Dawson Range activity, several of the major companies conducted regional programs, essentially prospecting and geochemical surveying, as well as specific property examinations.

Copper-Molybdenum

Casino Silver Mines Ltd. (57) optioned its property to Brameda Resources Ltd. in 1969. This prospect, located near the headwaters of Canadian and Casino Creeks, has undergone intensive exploration since 1969 when a copper-molybdenum deposit was discovered by a geochemical soil survey of Paton Hill. The area has been of interest since the

turn of the century as a gold-tungsten placer producer and prior to 1940 silver-lead veins were discovered. The veins were stripped by bulldozer in 1965 and underground exploration consisting of 1,200 feet of drifting and cross-cutting was done in 1966. Since the discovery of the copper and molybdenum, Brameda Resources Ltd. has completed a detailed exploration of the mineralized zone which included a total of 37,000 feet of standard diamond drilling, 17,500 feet of 4 7/8-inch rotary drilling and the mapping of 45 miles of trenches ripped by bulldozer. The deposit, on the basis of rock types, alterations, mineralization, structure and enrichment, is now recognized as closely resembling the Arizona porphyry copper deposits and is the first such in the Yukon. Brameda has announced mineable reserves of 179,000,000 tons having a grade of 0.37 per cent Cu. and 0.23 per cent Mo for a copper equivalent of 0.45 per cent, with a stripping ratio of 1.67 to 1.0



Canex Aerial Exploration Ltd. (57), a subsidiary of Placer Development Ltd., optioned its Granite Mountain property to the *Dawson Range Joint Venture*. Earlier work in 1966 consisted of 450 feet of rotary drilling and 3,000 feet of diamond drilling in six holes. The Dawson Range Joint Venture carried out geological mapping based on fragments in bulldozer trenches and identified a copper anomaly from a soil grid.

Yukon Revenue Mines Ltd. (57) optioned its prospect in the Dawson Range to *Kaiser Resources Ltd.* which conducted a thorough surface examination as well as a drill program. Surface work consisted of trenching, detailed mapping and soil sampling. Twenty-five two-inch percussion holes totalling 7,370 feet and 13 diamond drill holes totalling 6,074 feet were completed. The drill cores indicated that chalcopyrite, with traces of molybdenite, occurs in a quartz porphyry.

United Keno Hill Mines Ltd. (57) worked on the Mount Cockfield property in the Dawson Range held by *Newmont Mining Corp. of Canada Ltd.* This property is basically a molybdenite prospect with very little copper. The molybdenite occurs as veinlets and disseminations in a stock of quartz monzonite. The company did geological mapping, magnetometer surveys and geochemical sampling. Diamond drilling totalled 4,584 feet in six holes.

Atlas Explorations Ltd. (57) in a joint venture with *Dynasty Explorations Ltd.* and *Canadian Industrial Oil and Gas Ltd.* conducted a program of geological mapping, rock geochemistry and magnetometer surveying on the Klazan property in the Dawson Range. About 3,200 feet of diamond drilling demonstrated that molybdenite with pyrite occurs in a quartz stockwork in feldspar porphyry. Atlas and Dynasty also carried out exploration work on seven claim groups, the Bid, Royale, Vegas, Vina, Crown-Leo Lion, Max and Mim,



At Skagway concentrates for overseas markets are transferred from the bulk storage concentrate building by a series of conveyors to a deep sea bulk carrier — the final link in the chain of transport facilities that starts at the mine and ends in the ship's hold.

Photo courtesy of Yukon & White Pass Route

located in the Dawson Range area. Work done included line-cutting, geochemical sampling, magnetometer surveys, geological mapping, prospecting and rock chip sampling.

Imperial Oil Ltd. (58) completed a geochemical survey of its Cork claim group at the head of Burwash Creek, west of Kluane Lake. Eight holes for a total footage of 4,000 feet were diamond drilled. Argillites and Mush Lake volcanics are intruded by feldspar porphyry and granodiorite, the porphyry being sparsely mineralized with chalcopyrite and molybdenite.

Phelps Dodge Corporation (58) investigated its optioned property, at the heads of Raft and Alaskite Creeks, Kluane Lake area, with a geochemical survey, surface mapping and a small drilling program. Coarse molybdenite crystals and chalcopyrite veinlets are present in quartz veins in a host of coarse-grained alaskite or granite.

Texas Gulf Sulphur Co. (59) carried out regional geochemistry and prospecting in the Dawson and Stuart River areas, southwest of the Tintina Trench.

International Mine Services (57) completed 9,000 feet of diamond drilling on its Hayes Creek, zinc-molybdenum property. The molybdenite is present in a granite or granodiorite, while the sphalerite occurs separately, being sparsely disseminated in a quartz porphyry.

Dawson Range Joint Venture (57) completed 140,000 feet of line-cutting, 3,000 feet of bulldozer trenching and 27,000 feet of ripper cuts on its Hayes Creek property. Coarse-grained quartz diorite, quartz feldspar porphyry and Yukon Group quartz-mica schists were mapped in the trenches. Fresh pyrite with sparse chalcopyrite and molybdenite is disseminated in the schists and quartz feldspar porphyry.

Numerous other companies carried out stream silt sampling and reconnaissance prospecting in the Dawson Range, Nisling Range and immediately surrounding areas. (57) Most active of these were: *Atlas Explorations Ltd.*, *Amax Exploration Inc.*, *Archer-Cathro and Associates*, *Derry*, *Michener and Booth*, *Occidental Minerals*, *Quintana*, *Prado Explorations Ltd.*, *Empire Mercury Corporation Ltd.*, *Trans Columbia Explorations Ltd.*, *Cominco*, *Nippon Mining of Canada Ltd.* and *Newmar Explorations Ltd.* Further south in the Aishihik Lake area, *Conwest Exploration Ltd.* was active.

The techniques of these companies were essentially similar, as were their goals — the discovery of copper-molybdenum deposits associated with altered, quartz-rich acid intrusive rocks.

Copper

Lewes River Mines Limited (61) holds a large block of claims north, east and south of the city of Whitehorse. Recognizing that this overburden-covered area may contain the same contact zone between the Whitehorse Stock and Lewes River sediments that is the host of the New Imperial Mines Ltd. orebodies on the west side of the Yukon River, the company carried out extensive geophysical surveys in 1968 and 1969. Helicopter-borne magnetic surveys were helpful in delineating the intrusive-sediment contact. Areas along this contact were then subjected to ground magnetometer and I.P. surveys. In 1969, four diamond drill holes explored one such selected target area and in 1970 a total of 5,500 feet of diamond drilling in 11 holes was carried out.

Jackpot Copper Mines Ltd. (62) drilled five holes, totalling 1,700 feet, to test the width and continuity of a shear zone copper deposit outlined by ground geophysics in 1967 and bulldozer trenching in 1968 and 1969. Results so far indicate that the zone is mineralized with chalcopyrite for several hundred feet along strike, in widths ranging from two to seven feet.

Silver City Mines Limited (63) drove a 1,500-foot exploratory adit into their main showing on White River. Native copper and chalcocite with minor chalcopyrite are present as stringers and pods in Mush Lake basalts and andesites of Triassic age.

Alice Lake Mines Ltd. (58) drilled a copper, bornite, showing in volcanic rocks southwest of Kluane Lake.

Caltor Syndicate (64) carried out a geological mapping, prospecting and soil sampling program on a copper prospect, the Bell group of 48 claims, in the Watson Lake Mining District, north of McNeil Lake.

Canex Aerial Exploration Ltd. (61) carried out geophysical surveys and diamond drilling on properties that belong to Lewes River Mines Ltd., Wolf Creek Mines Ltd. and Topazios Exploration and Mining Company Ltd. in the Whitehorse Copper Belt.

Wind River Mines Ltd. (67) established a camp at its Joe copper prospect on the Wind River, 90 miles north of Elsa. Subsequent work included the construction of a small airstrip and stripping of showings. Wireline drilling in 10 holes totalled 1,460 feet.

Dynasty Explorations Ltd. and Atlas Explorations Ltd. (58) drilled three holes for a total footage of 709 feet on the Cub copper-zinc property in the Kluane area.

PICTURES OF THE PAST



Miners' Cabin — Testing paydirt samples for gold. Klondike Gold Rush, 1898-99

Photo courtesy of the Public Archives of Canada



Underground on #16 Eldorado Claim — Klondike Gold Fields, Yukon Territory. 1898-99.

Photo courtesy of the Public Archives of Canada



MINERAL EXPLORATION AND MINING - YUKON & N.W.T.

SCALE OF MILES

0 100 200 300 400

LEGEND

▲ PRODUCING MINE	++ RAILWAY
△ DEVELOPING MINE	— COMMERCIAL AIR ROUTE
(no.) AREAS OF ACTIVITY	
== EXISTING ROAD	

1 Giant Yellowknife Mines Ltd. Au Con-Rycon Mine Au	9 Yukon Coal Co. Ltd. C
2 Echo Bay Mines Ag Cu	10 Hudson - Yukon Mine Ni Cu
3 Canada Tungsten Mining C.Ltd.WCu	11 Terra Mining & Expl. Ltd. Ag
4 Pine Point Mines Ltd. Pb Zn	12 Cadillac Mines Ltd. Ag Pb
5 United Keno Hill Mines Ltd. Pb Zn Ag Cd	13 Venus Mines Ltd. Ag Au
6 New Imperial Mines Ltd. Cu	14 Norex Resources Ltd. Ag Silver Bay Mines Ltd. Ag
7 Cassiar Asbestos Corp. Ltd. Asb	15 Copper Pass Mines Ltd. Ni
8 Anvil Mining Corp. Ltd. Pb Zn Ag	16 Jason Explorers Ltd. Ni



PICTURES OF THE PAST



Thawing — General view of a boat dredge on a creek claim on Bonanza Creek in the Klondike Gold Fields. Yukon Territory, 1925.

Photo courtesy of the Public Archives of Canada



Group of miners on No. 1 Eldorado Creek — Klondike Gold Fields, Klondike, Y.T. 1898-99

Photo courtesy of the Public Archives of Canada

Silver-Lead-Zinc

Matt Berry Mines Ltd. (66) owns a property on the East Arm of Frances Lake which is under option to *International Nickel Company of Canada* and *Metallgesellschaft A.G.*. *Metallgesellschaft* completed 1,400 feet of diamond drilling and surface examination in November and December.

Dynasty Explorations Ltd. and Atlas Explorations Ltd. continued work in the Magundy River (69) and Fyre Lake (68) areas. Geological mapping, prospecting, and stream sampling constituted the program. Limited hand trenching was attempted on the Bot asbestos property. In the Anvil area, (70) the Lorna, Jean, Roto and Gran claims were staked over favourable geologic environments and geological, magnetic, geochemical and gravity surveys were completed. One hole, 600 feet deep, was drilled on a coincident gravity, magnetic anomaly with inconclusive results. Work on the Hess Project (71) included further reconnaissance geochemical survey work in the Nidderly Lake-Hudson Bay Tom claim area (75) and follow-up work on the Scot claims zinc prospect. Completion of geological, geochemical and geophysical surveys led to the diamond drilling of 1,500 feet in three holes on the Owl group gravity anomalies in the Tay River area. (70) No results of economic significance were reported.

Hecla Mining Co. of Canada Ltd. (70) carried out a program on its Hill-Rust property in the Vangorda Creek area consisting of 3,000 feet of diamond drilling in four holes, all of which tested gravity and IP anomalous areas indicated during the 1969 season, and detailed geological mapping.

Premier Mining Corporation Ltd. (72) trenched and sampled its silver-lead-zinc property located on the southwest side of Windy Arm, Tagish Lake.

Anvil Mining Corporation (70) explored its claims in the Swim Lakes area. The claims, staked on aeromagnetic and EM anomalies, are overburden covered. A track mounted Atlas-Copco drill was used successfully to drill through some 100 feet of overburden and into bedrock for geological samples.

Monarch Metal Mines Ltd. (66) optioned a property near Hyland River, Yukon, to Silver Mark Mines Ltd. This company did surface work and 7,000 feet of diamond drilling.

Hyland River Mines Ltd. (66) worked on its property 12 miles west of Mile 47 on the Canada Tungsten road, east of Francis Lake. The program included trenching, stripping and road building. The deposits consist of massive galena and sphalerite replacements along foliation in skarn and quartzite, adjacent to a small granitic body. Foliation trends east and dips steeply south.

Tungsten

Iso Exploration Ltd. (73) carried out a program on its recently discovered tungsten property located six miles east of the Coal River and 96 miles north of Watson Lake on the Yukon - N.W.T. border. The program included surface mapping and sampling.

International Mine Services (74) completed a silt sampling program in the McArthur Range on the north side of the MacMillan River, on the basis of which 200 claims were staked. Samples were reported to contain scheelite in a skarn contact zone between granites and metasediments.

United Keno Hill Mines Ltd. (74) combined stream silt sampling and reconnaissance prospecting in the McArthur Range area.

Hudson Bay Exploration and Development Co. (75) completed 1,000 feet of diamond drilling on its OMO group of claims and intend to do further drilling in 1971. This property contains a lens of nearly massive pyrrhotite carrying scheelite.

Amax Exploration Inc.'s (76) Mactung property consists of 70 claims on the Yukon-Mackenzie border with half of the claims in each territory. Diamond drilling was done in 1968. During 1970, a nine-mile road was built from the Canol Road to the property in preparation for further exploration in 1971.

Coal

Coal exploration is attracting interest and during the past year at least two firms were active in the Carmacks area, where the *Tantalus Butte Mine* is a producer of coal for Anvil Mining Corporation Ltd.

N.H. Ursel and Associates (77) took out exploration permits for coal in the Braeburn Lakes area, south of Carmacks.

Teslin Explorations Ltd. (77) of Calgary constructed a 4 mile access road from the Dawson Trail and did some 1,000 feet of trenching for sampling in a coal deposit, 12 miles southwest of Braeburn.

Atlas Explorations Ltd. (65) acquired exploration permits covering the area east of Carmacks on which prospecting and geological mapping were carried out.

NORTHERN ECONOMIC DEVELOPMENT BRANCH

The Branch is responsible for the management of all northern resources and for advancing the economic development of northern Canada. Its tasks are to seek out and

identify all possible ways and means of expanding the economy of the North at a more rapid pace; to develop a broad plan of economic progress and to recommend specific programs and policies for achieving these objectives. The Branch also undertakes feasibility studies relating to northern development in order to create a suitable climate of opportunity for investment. Studies include such matters as transportation, smelters, townsite planning, power, etc. Financial assistance is provided for those projects that are essential to the development of northern resources, one example being, the construction of Great Slave Lake Railway, which was undertaken to permit the development of Pine Point Mines.

The Branch is also responsible for establishing appropriate resource and economic development programs in line with the federal government's objectives. To meet these objectives the government has instituted many assistance programs to help the mineral industry overcome some of the high costs of operating in the North. These include the Northern Mineral Exploration Assistance Program, Prospectors' Assistance Program, Road and Airstrip Assistance Programs and Assay Services. In addition, financial support is given to organizations which assist in northern mineral development, such as Chambers of Mines and Accident Prevention Associations.

In order to discharge its functions, the Branch is subdivided into four groups; Oil and Mineral Division; Water, Forests and Land Division; Economic Staff Division, and Administrative Services Division.

This publication details mining activity north of 60 and, since the management of mining lands in this region rests with the Oil and Mineral Division, the responsibilities of that Division and its mining section are described in more detail on the following pages.

The Oil and Mineral Division is responsible for:

- (a) the management and administration of Crown mineral rights in the Yukon Territory and Northwest Territories, including offshore areas lying north of the line described in the schedule to Order in Council P.C. 1965-2284;
- (b) the formulation and recommendation of policies designed to encourage resource exploration and development, including the terms of disposal of mineral rights;
- (c) the planning and assessment of programs designed to provide an adequate infrastructure so that the natural resources, when found, can be profitably developed and delivered to market;
- (d) the evaluation of natural resource exploration and development projects to determine whether they qualify for any of the assistance programs available and/or government support in other areas;

- (e) the assessment of national fiscal policies and subsidy programs as they affect northern natural resources;
- (f) the administration of industrial safety legislations; and
- (g) representing the Department in discussions with the industries concerned and with other departments in the resource field.

Officers responsible for the administration of the above program of work are listed in the table following.

Department of Indian Affairs and Northern Development

Minister	Jean Chrétien	Ottawa, Ontario
Deputy Minister	H.B. Robinson	Ottawa, Ontario
Assistant Deputy Minister	A.D. Hunt	Ottawa, Ontario

Northern Economic Development Branch

Acting Director	A.J. Reeve	Ottawa, Ontario
Regional Director	G.A. McIntyre	Whitehorse, Y.T.
Regional Director	F.A. McCall	Yellowknife, N.W.T.

Oil and Mineral Division

Chief	H.W. Woodward	Ottawa, Ontario
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Mining Section

Administrator of Mining	B.J. Trevor	Ottawa, Ontario
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Mining Lands Unit

Supervising Mining		
Recorders	R.J. Simard	Ottawa, Ontario
	B. Baxter	Whitehorse, Y.T.
Mining Recorders	F.V. Daly	Ottawa, Ontario
	M. Munroe	Dawson, Y.T.
	R.G. Ronaghan	Mayo, Y.T.
	R.L. Williams	Watson Lake, Y.T.
	D.W. Gairns	Yellowknife, N.W.T.

Inspection Services Unit

Chief Mining Engineer	S. Homulos	Ottawa, Ontario
Resident Mining Engineers	G. Needham	Whitehorse, Y.T.
	M.L. Brown	Yellowknife, N.W.T.
Assistant Mining Engineer	J. Torrington	Whitehorse, Y.T.

Mine Rescue

Superintendents	J.L. Comeau	Yellowknife, N.W.T.
	J.D. Barraclough	Whitehorse, Y.T.

Evaluation and Geological Services Unit

Head	A.D. Oliver	Ottawa, Ontario
Resident Geologists	D.B. Craig	Whitehorse, Y.T.
	R.W. Hornal	Yellowknife, N.W.T.

Development Analysis Section

Head	E.G. Puddington	Ottawa, Ontario
Assistant Head	L. Bereza	Ottawa, Ontario

MINING SECTION

This section is responsible for the administration of mining and mineral rights (excluding oil and gas) from the acquisition of claims through to the production stage, including safety in mines. The section is comprised of three units — Mining Lands, Evaluation and Geological Services and Inspection Services. The responsibilities for their operation rest with the Administrator of Mining.

MINING LANDS UNIT

For administrative purposes the Territories have been divided into seven mining districts, each of which has been allocated a Mining Recorder and supporting staff. The Mining Recorders are responsible for the disposition of the mineral rights within their respective districts in accordance with the legislation applicable. For each Territory there is a Supervising Mining Recorder whose principal function is to ensure that uniform practices are observed in the administration of the various mining acts and regulations. When necessary, the Supervising Mining Recorder interprets such acts and regulations and prepares directives and instructions.

A detailed study of computerized recording methods was started in 1968 with the object of developing a system which would (a) eliminate the possibility of errors in posting documents in the records, (b) provide a better and faster method of information retrieval, (c) reduce the time taken to record procedures and update records and (d) provide a means of rapid replacement of records should they be destroyed or damaged.

A test program was implemented during April, May and June 1970. The data processed consisted of all the transactions pertaining to the recording of claims filed through the Mackenzie Mining District office during that period. The information relating to the transactions was transmitted to the Key punch operator on a claim data entry form designed for that purpose.

The results of the test were encouraging and while the reports that the computerized system produced contained basically the same data that can be retrieved under the present one, improvements in the overall operation and a saving in time were quite evident.

It was decided that effective January 1, 1971 the Arctic and Hudson Bay Mining office would implement the computerized system but that the present recording system would be maintained until it was certain that the proposed system confirms the results of the tests. Should the computerized system prove satisfactory, it will be introduced in all the recording offices in the Northwest Territories and the Yukon Territory by 1973.

A microfilming program is currently under study and it is anticipated that a report on it will be available this year.

The districts and locations of Mining Recorders' offices are as follows:

	District	Office
Yukon Territory	Mayo	Mayo, Y.T.
	Dawson	Dawson, Y.T.
	Watson Lake	Watson Lake, Y.T.
	Whitehorse	Whitehorse, Y.T.
Northwest Territories	Mackenzie	Yellowknife, N.W.T.
	Nahanni	Watson Lake, Y.T.
	Arctic and Hudson Bay	Ottawa, Ontario

Mineral claims staked and recorded in the Yukon Territory and Northwest Territories during 1970 with comparative figures for 1969 are tabulated below:

Yukon Territory

District	Claims Recorded	
	1969	1970
Whitehorse	12,927	8,609
Dawson	846	848
Mayo	1,489	768
Watson Lake	996	1,294
Total	16,258	11,519

Northwest Territories

District	Claims Recorded	
	1969	1970
Mackenzie	10,589	8,852
Arctic and Hudson Bay	8,031	5,213
Nahanni	463	509
Total	19,083	14,574

INSPECTION SERVICES UNIT

Headed by the Chief Mining Engineer for the Yukon and Northwest Territories stationed at Ottawa, this unit is responsible for all inspections, including safety inspections, of mines and mills, claims, assessment work on claims and other industrial operations north of the 60th parallel. It is also responsible for the preparation of new safety legislation, mine rescue and first aid training, operation of assay services and all other technical matters pertaining to mining.

Resident Mining Engineers are located at Whitehorse, Yukon Territory, and at Yellowknife, in the Northwest Territories.

During 1970 a complete revision of mining Safety Rules was completed, including new open pit rules for both Territories. These are expected to be adopted in 1971.

The fourth Canadian Mine Rescue Competition was held at Yellowknife on June 13, 1970 with teams from British Columbia, Alberta, Saskatchewan, Nova Scotia, the Yukon Territory and the Northwest Territories competing. The mine Rescue Team from the Texaco Mine in British Columbia took first place and the Devco Team from Nova Scotia was runner-up.

The Inspection Services Unit that directed the competition wishes to thank the Yellowknife Mine Rescue Committee, the citizens of Yellowknife and the Chief Inspectors of all competing provinces who supplied Judges and other experts, and thus helped to make this a most successful event.

MINE RESCUE

An additional 5 Draeger Units will be added to each Territory during 1971 to be placed in new mines that will come into production shortly. The present disposition of Draeger Equipment:

Yukon

Mine Rescue Station	12
United Keno Hill Mines Ltd	12
Tantalus Coal Company	6
Hudson Yukon Mine	6

N.W.T.

Central Station	12
Echo Bay Mines	6
Terra	6

MINING SAFETY STATISTICS — YUKON AND NORTHWEST TERRITORIES

The American Standard method of recording work injuries is used throughout and, in the case of accidents resulting in death, permanent total disability and permanent partial disability, the number of days recorded as lost time as a result of these accidents conforms with the scheduled time charges set down in the above noted Standard.

Disabling injuries are defined as those which result in death, permanent total disability, permanent partial disability or temporary total disability.

Days recorded as lost time are calendar days lost, but do not include the day of the accident or the day of return to work.

Accident frequency is expressed as the number of accidents per 1,000,000 man-hours worked.

Accident severity is expressed as the number of days lost as a result of the accident per 1,000,000 man-hours worked.

ACCIDENT STATISTICS — 1970

To the end of December 1970, there were 130 disabling injuries reported in the Yukon. The accident frequency for disabling injuries increased from 45 in 1969 to 47 in 1970. Accident severity increased from 770 in 1969 to 3163 in 1970. "Fall of persons" was the chief cause of accidents in the Yukon, accounting for 30 per cent of all accidents followed by "Struck by moving object" and "Strain while lifting". These three main causes accounted for 60 per cent of all accidents reported.

There was one fatal accident during the year in the Yukon Territory. On December 12, 1970 a heavy duty truck driver was fatally injured when his vehicle went over the edge of a waste dump at the Anvil Mine.

In the Northwest Territories 81 disabling injuries were reported. Accident frequency increased from 20 in 1969 to 26 in 1970, while the severity increased from 3578 to 8580 in 1970. In the Northwest Territories "Fall of persons" and "Fall of rock" were the two chief causes of accidents, accounting for 38 per cent of all accidents reported.

Two fatal accidents occurred at the Con Mine, in the Northwest Territories. On May 8, 1970, a repairman was killed when he was struck by a descending cage and fell to the bottom of the B 3 Winze. On June 12, 1970 a stope miner died instantly when he was crushed by a large piece of loose rock in 4111 AX stope.

Pine Point Mines had one fatal accident on October 30, 1970. A labourer died in hospital of injuries received when a stack of lumber he was helping to unload from a truck fell on him.

A miner was asphyxiated by carbon monoxide gas at the face of a raise at Terra Mines on January 28, 1970.

EXPLORATION AND GEOLOGICAL SERVICES UNIT

This unit provides a geological information and advisory service to those engaged in the mineral industry in the Yukon and Northwest Territories. Resident Geologists' offices are maintained in Whitehorse, Yukon, and Yellowknife, Northwest Territories. Geological Survey of Canada publications, such as geological, geophysical and topographical maps, memoirs, papers and reports, are available for sale to the public. A library of released technical assessment reports is available for reading and copying by means of a microfilm system. A small library of technical books and mining publications is also maintained for public convenience.

The Resident Geologists carry out mineral property examinations, collect rocks and mineral specimens and advise the mineral industry, government departments and research scientists on geological problems arising out of their work in the territories. The service entails carrying out engineering and geological evaluations on mining developments in the Yukon and Northwest Territories and providing a consulting geological service for projects where government assistance is solicited, such as the Prospectors' Assistance Program, the Northern Mineral Exploration Assistance Program and the Northern Airstrip Assistance Program.

The Resident Geologists assist prospectors and geologists by identifying rock and mineral specimens, assisting in prospectors' training courses, preparing geological compilation maps on mineralized areas and giving direction when requested. Summer field surveys are carried out under the direction of the Resident Geologists as part of the mineral deposit inventory program.

The service is also responsible for evaluating all geological, geophysical, geochemical and other related work submitted as representation work in respect of mineral claims.

DEVELOPMENT ANALYSIS SECTION

This section initiates, implements and maintains policies and development programs and projects designed to stimulate the exploration for non-renewable resources in the Yukon and Northwest Territories.

The prime activities to date have been concerned with carrying out financial and engineering evaluations of resource developments in the Yukon and Northwest Territories where government assistance has been requested, and in administering programs designed to encourage resource development in the north.

Further studies of the logistics and marketing aspects of the proposed development of Baffinland Iron Mines Limited were conducted. These were done essentially to update earlier economic feasibility studies necessary to assess the Company's request for financial assistance amounting to approximately \$32 million to provide a railroad, roads, airstrips, harbour facilities and a townsite.

Financial assistance in the amount of \$495,316 for access-road construction, of which \$186,286 was disbursed in 1970 was recommended for the following companies:

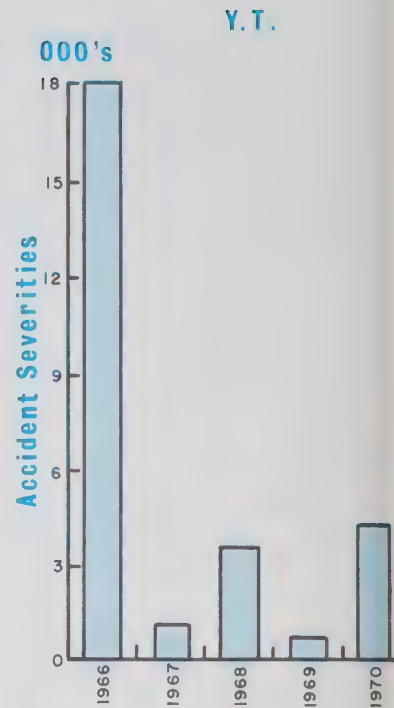
1. Cadillac Explorations Limited
2. Western Minerals Limited
3. Acorn Timber Limited
4. Anvil Mining Corporation Limited
5. Hudson Bay Mining and Smelting Co. Ltd.
6. Venus Mines Limited
7. Ace R. Parker and Associates

MINING ACCIDENT SEVERITIES

Yukon Territory

Mine	Number of Man-Hours Worked 1970	Number of Days Lost Jan-Dec. 1970	Accident Severity 1970	Accident Severity Jan-Dec. 1969
Anvil Mining Corp.	826,806	6,513	7,877	745
Cassiar Asbestos Corp.	710,545	458	645	395
Hart River Mines	6,390	7	1,095	0
Hudson Bay Tom Claims	19,744	71	3,596	0
Hudson Yukon Mining Co. Ltd.	39,391	43	1,092	0
Mount Nansen	3,219	0	0	4,198
New Imperial	525,511	358	681	183
United Keno Hill Mines Ltd.	551,200	1,108	2,010	1,251
Venus Mines Ltd	70,678	106	1,500	127
Tantalus Butte Coal Mine	18,312	103	5,625	375
TOTAL	2,771,596	8,767	3,163	770

Accident severity is the number of days lost per 1,000,000 man-hours.

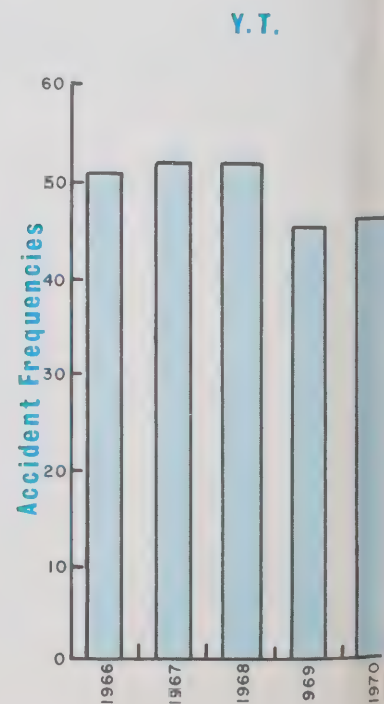


MINING ACCIDENT FREQUENCIES

Yukon Territory

Mine	Number of Man-hours Worked 1970	Number of Accidents Jan-Dec. 1970	Accident Frequency Jan-Dec. 1970	Accident Frequency Jan-Dec. 1969
Anvil Mining Corp.	826,806	45	54	25
Cassiar Asbestos Corp.	710,545	16	23	28
Hart River Mines	6,390	1	156	0
Hudson Bay Tom Claims	19,744	4	203	0
Hudson Yukon Mining Co. Ltd.	39,391	3	76	0
Mount Nansen	3,219	—	—	135
New Imperial Mines Ltd.	525,511	26	49	60
United Keno Hill Mines Ltd.	551,200	18	33	48
Venus Mines Ltd.	70,678	15	212	169
Tantalus Butte Coal Mine	18,312	2	109	187
TOTAL	2,771,596	130	47	45

Accident frequency is number of accidents per 1,000,000 man-hours

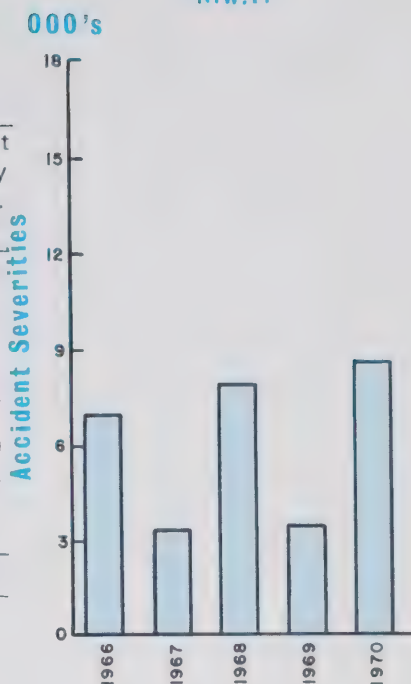


MINING ACCIDENT SEVERITIES

Northwest Territories

Mine	Number of Man-Hours Worked 1970	Number of Days Lost Jan-Dec. 1970	Accident Severity Jan-Dec. 1970	Accident Severity Jan-Dec. 1969
Canada Tungsten Mining Corp Ltd.	184,801	85	460	326
Con-Rycon-Vol-Yellorex	497,663	12,263	24,641	1,219
Echo Bay Mines Ltd.	199,790	68	340	627
Giant Yellowknife Mines Ltd.	839,545	1,495	1,781	7,825
Penarroya Canada Ltée.	73,984	7	95	0
Pine Point Mines Ltd.	1,146,081	6,201	5,411	1,322
Terra Mining Exploration Ltd.	144,301	6,359	44,068	0
TOTAL	3,086,165	26,478	8,580	3,578

Accident Severity is number of days lost per 1,000,000 man-hours.

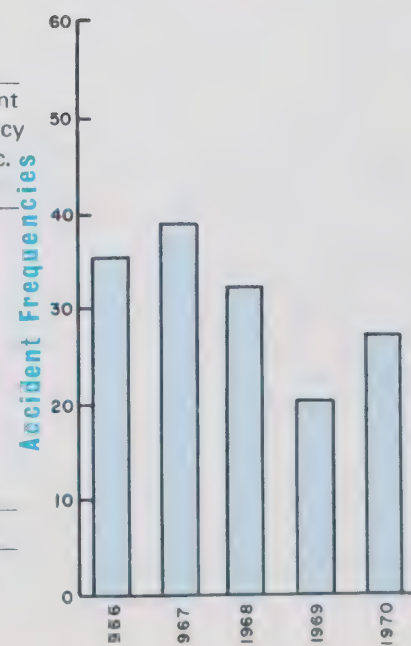


MINING ACCIDENT FREQUENCIES

Northwest Territories

Mine	Number of Man-Hours Worked 1970	Number of Accidents Jan-Dec. 1970	Accident Frequency Jan-Dec. 1970	Accident Frequency Jan-Dec. 1969
Canada Tungsten Mining Corp Ltd.	184,801	7	38	26
Con-Rycon-Vol-Yellorex	497,663	9	18	11
Echo Bay Mines Ltd.	199,790	18	90	80
Giant Yellowknife Mines Ltd.	839,545	25	30	17
Penarroya Canada Ltée.	73,984	2	27	0
Pine Point Mines Ltd.	1,146,081	3	3	77
Terra Mining and Exploration Ltd.	144,301	17	118	0
TOTAL	3,086,165	81	26	20

Accident Frequency is number of accidents per 1,000,000 man-hours.



CAUSES OF DISABLING INJURIES IN MINES

Yukon Territory

Causes of Injuries	Anvil Mining Corp.	Cassiar Asbestos Corp.	Hart River Mines Ltd.	Hudson Bay Tom Claims	Hudson Yukon Mining Co. Ltd.	Mount Nansen Mines Ltd.	New Imperial Mines Ltd.	United Keno Hill Mines Ltd.	Venus Mines Ltd.	Tantalus Butte Coal Mine	TOTAL
Drilling	—	—	—	—	1	—	—	1	2	—	4
Caught between two objects	5	1	—	—	—	—	2	2	1	1	12
Strain while lifting	3	6	—	—	1	—	5	2	2	—	19
Fall of persons	15	6	—	—	1	—	8	4	5	—	39
Struck by moving object	17	—	—	1	—	—	2	—	—	—	20
Foreign matter in eyes	2	—	—	—	—	—	4	—	—	—	6
Tramming cars	—	—	—	—	—	—	—	—	1	1	2
Fall of rock	—	—	—	1	—	—	—	3	2	—	6
Falling object	—	—	—	1	—	—	1	3	—	—	5
Blasting	—	—	—	—	—	—	—	—	—	—	0
Gassing	—	—	—	—	—	—	—	—	—	—	0
Miscellaneous	3	3	1	1	—	—	4	3	2	—	17
TOTAL	45	16	1	4	3		26	18	15	2	130

Financial assistance in the amount of \$96,600, for airstrip construction assistance, of which \$957 was disbursed in 1970, was recommended for the following companies:

1. Bathurst Inlet Developments Limited
2. Triad Oil Co. Ltd. (B.P. Oil and Gas Ltd.)
3. International Mine Services Ltd.
4. Atlas Explorations Ltd.
5. Western Minerals Ltd.
6. Panarctic Oils Limited.

A total of \$591,916 was committed to these projects in accordance with the provisions of the Road and Airstrips Assistance Program whereby the Federal Government will share the costs of approved construction.

INCENTIVE PROGRAMS

Prospectors' Assistance Program

In both the Yukon Territory and Northwest Territories, a combined amount of \$50,000 is available in the form of grants to aid prospectors in their search for mineral deposits. A prospector may receive up to \$900 each year to help finance his prospecting venture. The program has been well received since its introduction in 1962 and was instrumental in the location of several mineral discoveries.

During 1970, the entire amount was committed. Thirty-three prospectors in the Northwest Territories and thirty-three in the Yukon Territory participated in the program.

CAUSES OF DISABLING INJURIES IN MINES

Northwest Territories

Causes of injuries	Canada Tungsten Mining Corp. Ltd.	Con-Rycon-Vol-Yellorex	Echo Bay Mines Ltd.	Giant Yellowknife Mines Ltd.	Penarroya Canada Ltée.	Pine Point Mines Ltd.	Terra Mining and Exploration Ltd.	TOTAL
Drilling	1	—	—	—	—	—	2	3
Caught between two objects	1	—	4	3	—	—	—	8
Strain while lifting	1	—	2	1	—	1	3	8
Fall of persons	2	4	3	10	—	—	2	21
Struck by moving object	—	—	2	3	—	—	3	8
Foreign matter in eyes	—	1	—	1	—	—	—	2
Tramming cars	—	1	—	—	—	—	—	1
Fall of rock	—	3	1	3	1	—	2	10
Falling object	—	—	3	1	—	1	3	8
Blasting	—	—	—	—	—	—	—	—
Gassing	—	—	—	—	—	—	1	1
Miscellaneous	2	—	3	3	1	1	1	11
TOTAL	7	9	18	25	2	3	17	81

Northern Mineral Exploration Assistance Program

This program is designed to encourage mineral exploration activity in the Yukon Territory and Northwest Territories by providing grants of up to 40 per cent of the cost of approved exploration programs for minerals or oil and gas in the North. A total of 176 corporate applicants have applied for assistance in one or more programs of exploratory work.

Since the inception of the Program in 1967, 111 applications have been approved and a total of \$2,998,315.36 has been paid in grants, leaving an outstanding commitment of \$637,644.77. Moreover, payments of \$9,022,500 have been made towards a large program of oil and gas exploration in the Arctic Islands.

Northern Roads Program

The Northern Roads Program which was approved by the Federal Government in 1965 called for an annual expenditure of \$10 million for the following 10 years in both Territories. It is the first phase of a long-range, 20-year program designed to bring permanent roads to within 200 miles of all potential areas of resource development. The policy was designed to be sufficiently flexible to allow revisions in priorities from year to year to keep pace with resource development. It also allowed for a shift in volume of construction from one Territory to another, depending on the requirements and based on northern territorial development.

Instead of placing emphasis on resource potential alone, the road program is based on a multiple concept having as its objective the creation of a broad network of road loops to serve all needs.

A number of classifications of roads are included in the first 10-year program. They include roads to tap the rich resource potential of the Territories and highways to provide communication between established communities. The principal types of roads under the program are as follows:

Communication and Network Roads — To provide connecting links between the Territories, the Province, and population centres with the Territories. Construction costs and 85 per cent of maintenance costs will be paid by the Federal Government. Fifteen per cent of maintenance costs is borne by the Territorial Governments.

Area Development Roads — To lead into resource-potential areas, they are planned to fit in with and extend the overall road network plan. The Federal Government will bear the initial construction costs for this type of road with maintenance to be shared by the Federal and Territorial Governments on an 85 — 15 per cent basis.

Permanent Access Roads — To lead from the nearest permanent road to a resource development about to go into production. Federal assistance under the new program may be up to, but shall not exceed (a) $66\frac{2}{3}$ of actual road cost, (b) 15 per cent of actual capital expended by the company for exploration or development prior to commencement of commercial production or exploration, (c) \$40,000 per mile.

Initial Access Roads — Low standard winter, or year-round roads to provide an established resource exploration or development project with access to a network road. Federal assistance here will be the lesser of 5 per cent of exploration costs or 50 per cent of actual construction cost of the road, which is to be maintained by its primary user — the company concerned.

Northwest Territories

Mackenzie Highway N.W.T. 1

- (a) Extension of this new trunk highway from Mile 169 to Mile 229 was completed in 1970. Total cost \$3,086,415, with a current year expenditure of \$223,000.
- (b) Extension of this trunk highway from Mile 229 to Fort Simpson, Mile 296 is scheduled to be completed in 1971. Total cost \$2,753,000, with a current year cost of \$1,796,000.

- (c) Right-of-way clearing on this highway location south of Inuvik from Mile 932 to Mile 962 was completed at a cost of \$92,500.

Fort Liard Highway

- (a) Mile 0 to Mile 34 contract for right-of-way clearing (\$123,000) is now completed.
- (b) Mile 0 to 67 clearing, grubbing, grading, drainage, structures and gravel surfacing (\$3,200,000 with a current year cost of \$1,314,000) is on schedule (first year of a two-year project).

Fort Resolution Road

Construction of a 42-mile secondary trunk road linking Pine Point and Fort Resolution was started in 1970. A two-year contract was let to construct 21 miles at a cost of \$700,000 (current year expenditure \$200,000).

Fort Smith Highway

The second year of a two-year contract for gravel surfacing and stockpiling for Mile 38 to Mile 166 is now complete. Total cost \$605,141, with current year expenditures of \$215,000.

Yukon

Whitehorse-Keno Road

Upgrading of 17 miles of trunk road standard at a cost of \$500,000, was carried out in 1970.

Dawson Road

Subgrade, widening and surfacing from Mile 0 to Mile 50 is underway. Some rock excavation is also being undertaken at strategic locations for connecting future development roads. Current year expenditures will be in excess of \$450,000 for all phases of the work.

Skagway Highway

A new bridge was constructed at Carcross. Contract amount was \$365,000 and work was completed in the Fall of 1970.

Campbell Highway

Crushed gravel surfacing of 142 miles from Ross River to Carmacks will be completed in the Fall of 1971. Second of a two-year contract in the amount of \$1,398,150.

Dempster Highway

Road construction from Mile 78 to Mile 123 will be completed in the Fall of 1971. Current year cost \$1,316,000. Ogilvie River bridge has been designed by D.P.W. and will be constructed in 1971-72 by the Department of National Defence.

Tote Roads

In addition to road and airstrip assistance which is administered by the Federal Government, \$100,000 is available in each Territory each year for the construction of low class roads to provide temporary seasonal or year-round access in connection with any natural resource development project. The program is administered by the Commissioner of each Territory. Construction is the responsibility of the individual or company concerned and costs incurred for such roads may be shared up to a maximum of 50 per cent of the cost.

Eight applications in the amount of \$46,802.62 for tote road assistance were received covering oil, mining, agriculture

and tourist enterprises in the Northwest Territories in 1970. As of December 31, 1970 \$28,947.62 had been paid out. In the Yukon, 28 applications for tote trail assistance were processed up to December 31, 1970 and \$20,536.04 paid to nine applicants. A further \$80,877.25 has been allotted to other applicants; of this amount \$63,022.25 is for applicants in the Yukon Territory and \$17,855.00 for applicants in the Northwest Territories.

Assay Service

There were approximately 738 assays carried out during 1970 at the Government Assay office at Yellowknife – the number of free assays performed, either under the provisions of the Prospectors' Assistance Program or as provided for under the Canada Mining Regulations, amounted to 602 determinations at a value of \$2,075.

In the Yukon Territory, 50 per cent of the cost of 10 assays per prospector per year is paid by the Federal Government and during 1970, approximately 473 assays were paid for at a cost of \$2,281.50 to the Federal Government.

VALUE OF PRODUCTION - Y.T. - N.W.T.

MILL

\$

25

225

200

175

150

125

100

75

50

25

0

1961

1962

1963

1964

1965

1966

1967

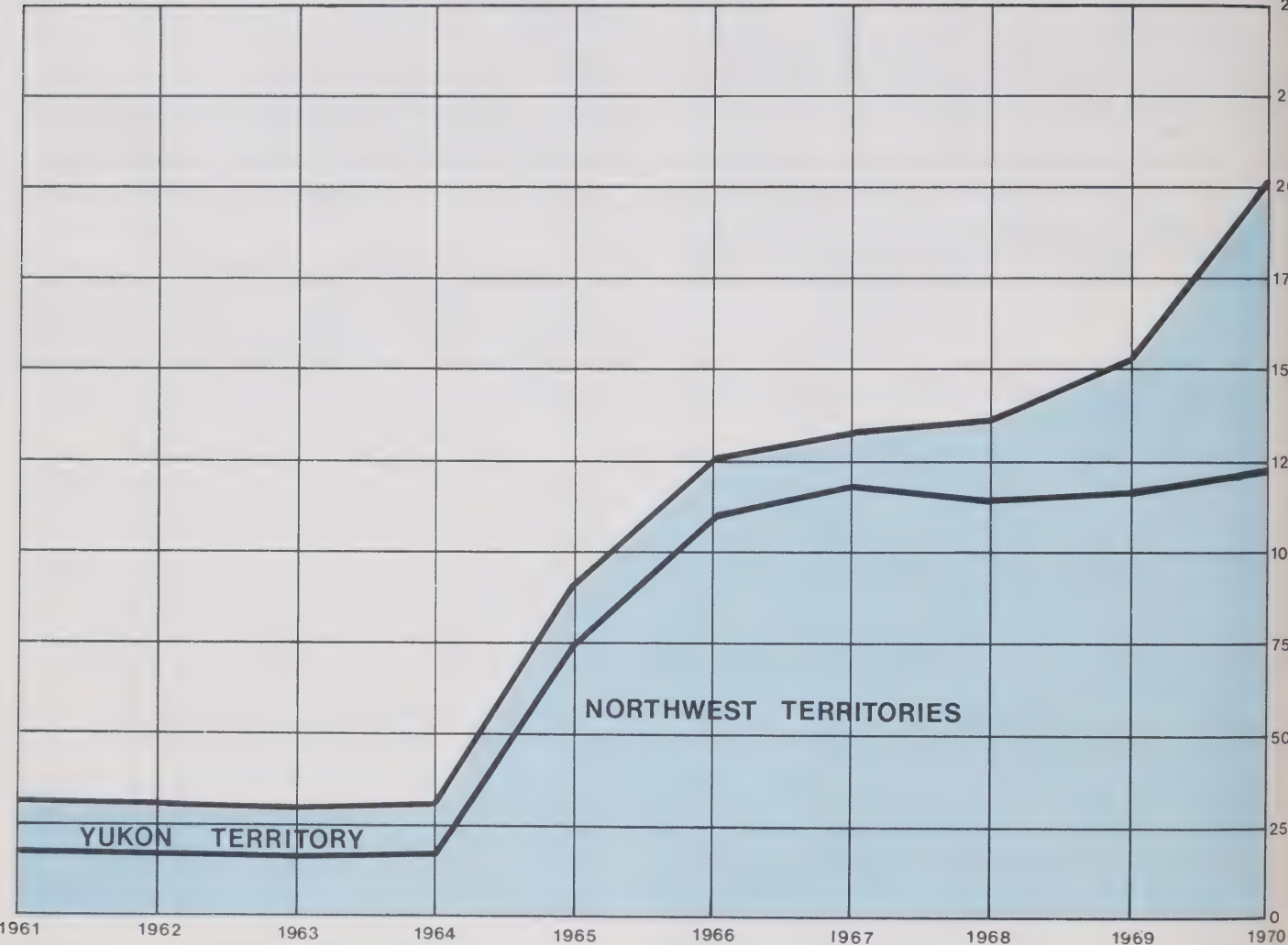
1968

1969

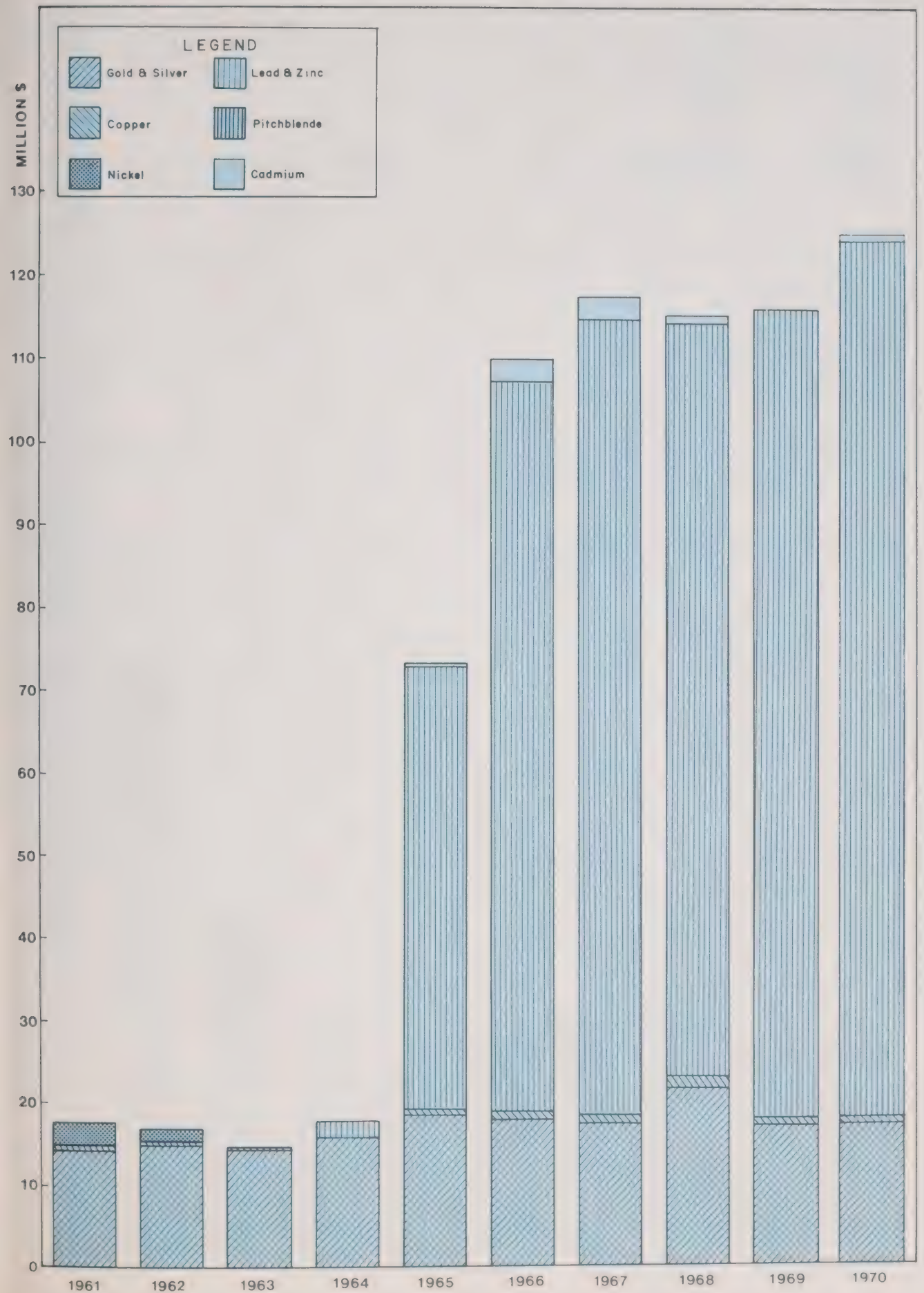
1970

NORTHWEST TERRITORIES

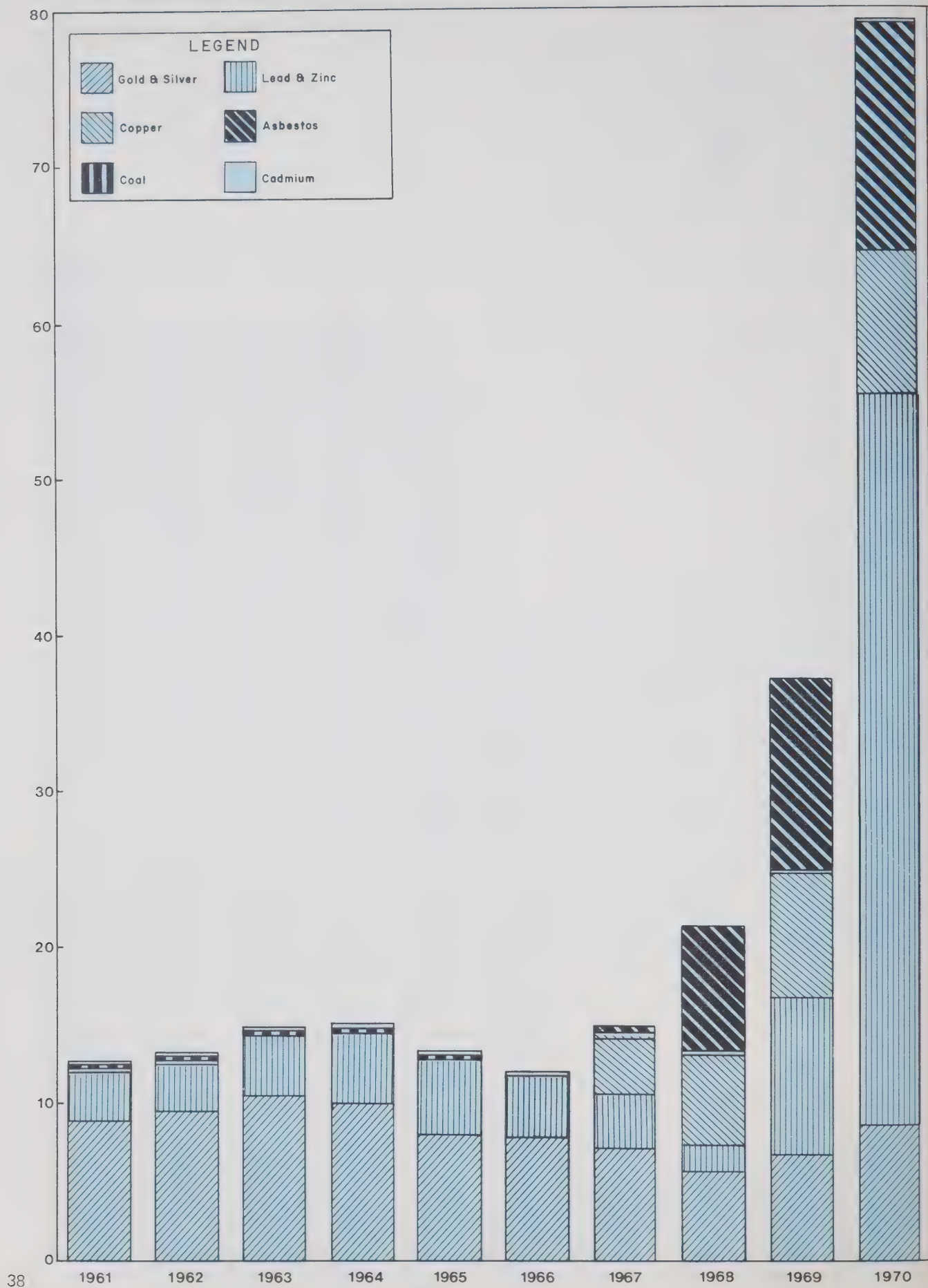
YUKON TERRITORY



VALUE OF MINING PRODUCTION N.W.T.



VALUE OF MINING PRODUCTION - YUKON



Mineral	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970(a)	Cumulative Totals (b)
Gold \$ ounces	14,449,028 407,474	14,974,924 400,292	14,609,250 387,000	15,586,182 412,879	17,071,580 452,479	15,990,133 424,029	14,356,476 380,304	13,285,459 352,306	12,381,240 328,502	11,686,310 319,560	290,839,763
Silver \$ ounces	73,419 77,890	84,814 72,802	107,216 77,468	91,312 65,223	1,490,754 1,064,824	2,325,407 1,662,192	3,429,755 1,980,228	8,677,365 3,751,563	3,910,888 2,026,367	4,671,250 2,525,000	26,447,891
Copper \$ pounds	270,440 926,480	194,928 628,801	10,281 32,638	. . . . .	354,342 942,400	672,065 1,496,805	538,077 1,131,126	833,169 1,732,160	643,761 1,251,723	631,100 1,086,800	5,098,463
Nickel \$ pounds	2,604,789 3,409,410	1,503,837 1,801,002	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	12,850,205
Lead \$ pounds	. . . . .	. . . . .	. . . . .	823,279 6,125,588	25,677,695 165,662,547	31,472,562 210,659,720	35,665,535 254,753,820	33,636,984 250,275,180	32,299,014 212,913,740	34,804,000 220,000,000	194,379,069
Zinc \$ pounds	. . . . .	. . . . .	. . . . .	1,111,016 7,840,620	28,596,474 189,380,626	57,128,344 378,333,400	60,852,900 419,964,800	57,504,129 407,830,700	68,275,481 448,296,000	71,685,000 450,000,000	345,153,344
Pitchblende(d) . . \$ pounds	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	79,477,897
Cadmium \$ pounds	. . . . .	. . . . .	. . . . .	. . . . .	516,635 185,840	2,769,372 1,073,400	2,551,920 911,400	774,060 271,600	675,136 191,800	526,400 140,000	7,813,523
TOTAL \$	17,397,676	16,758,503	14,726,747	17,611,789	73,707,480	110,357,883	117,394,663	114,711,166	118,185,520	124,004,060	962,060,155
YUKON TERRITORY											
Gold \$ ounces	2,371,494 66,878	2,050,255 54,805	2,084,215 55,211	2,183,611 57,844	1,698,975 45,031	1,639,103 43,466	675,725 17,900	911,338 24,167	1,118,715 29,682	746,000 20,400	267,864,802(c)
Silver \$ ounces	6,538,897 6,937,086	7,551,814 6,482,244	8,450,755 6,106,037	7,894,196 5,638,712	6,462,393 4,615,995	5,868,217 4,194,580	6,701,756 3,869,374	4,806,384 2,077,987	5,182,166 2,685,060	7,890,250 4,265,000	146,127,180
Lead \$ pounds	1,712,198 16,769,815	1,615,980 16,290,125	1,867,647 16,978,607	2,744,235 20,418,415	2,766,953 17,851,309	2,386,684 15,975,125	2,141,959 15,299,709	970,629 7,221,940	4,256,183 28,056,581	21,748,500 137,475,000	82,301,502
Copper \$ pounds	257,098 880,773	132,990 429,000	. . . . .	. . . . .	. . . . .	. . . . .	3,409,779 7,167,919	5,097,157 10,597,000	7,645,623 14,866,077	9,000,800 15,500,000	28,255,142
Coal \$ tons	114,221 7,703	115,198 7,649	123,675 8,231	98,150 7,229	85,626 8,801	46,390 5,670	15,791 1,912	. . . . .	. . . . .	. . . . .	2,567,132
Zinc \$ pounds	1,528,100 12,137,418	1,438,554 11,888,876	1,514,520 11,850,706	1,855,512 13,094,653	2,000,396 13,247,653	1,729,027 11,450,510	1,373,151 9,476,545	748,206 5,306,429	5,035,385 33,062,280	24,846,900 155,975,600	64,367,909
Cadmium \$ pounds	228,296 142,685	231,328 134,493	326,124 135,885	428,399 132,222	386,192 138,918	306,336 118,735	265,997 94,999	147,716 51,830	239,965 68,172	236,900 63,000	6,076,476
Asbestos \$ tons	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	406,371 2,260	8,684,125 63,592	11,924,526 87,437	15,173,000 108,000	36,188,022
TOTAL \$	12,750,304	13,136,119	14,366,936	15,204,103	13,400,535	11,975,757	14,990,529	21,365,555	35,402,563	79,642,350	633,748,165

(a) Preliminary Figures

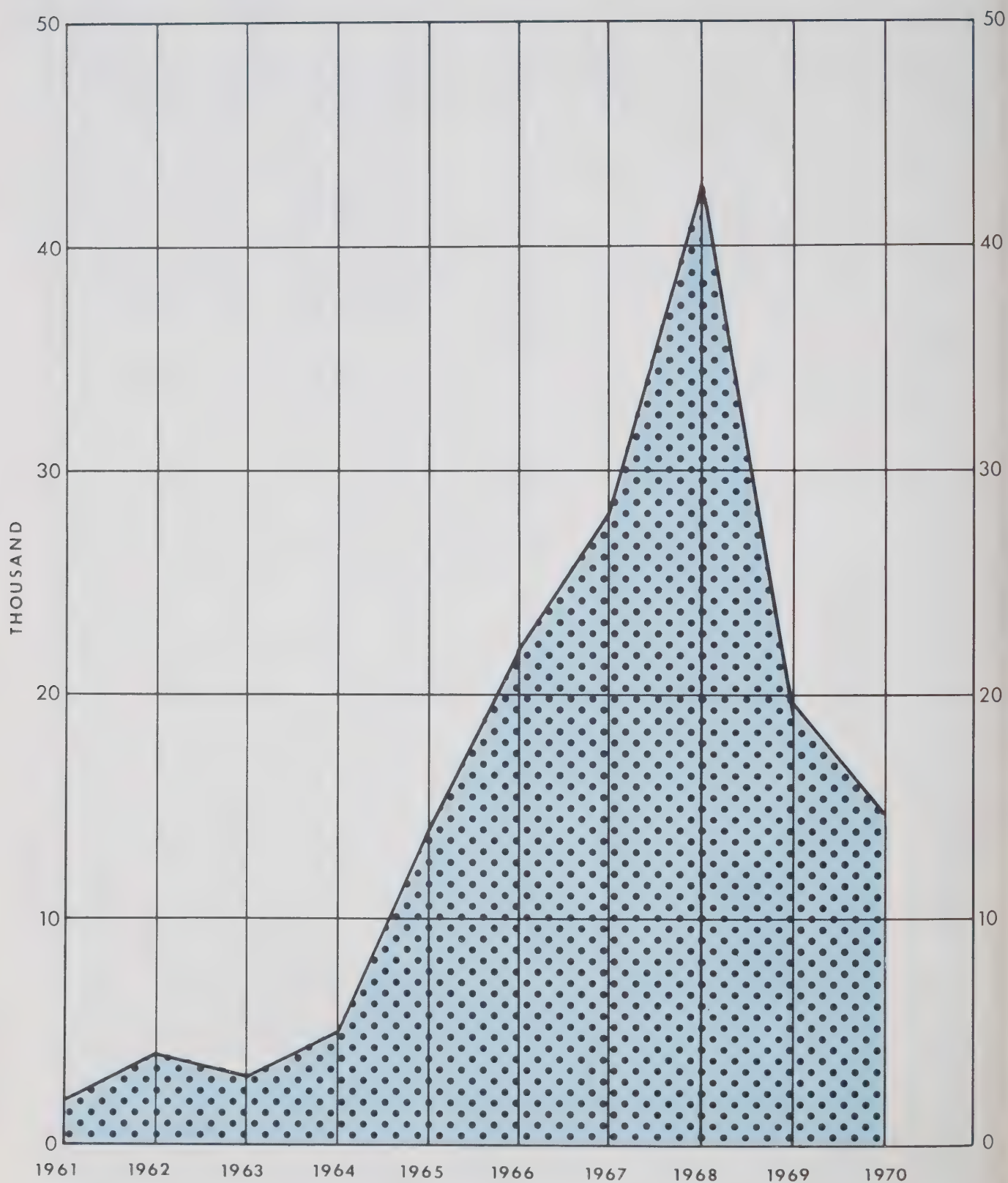
(b) Cumulative Totals — 1932 to December 31, 1970

(Figures for tungsten not available)

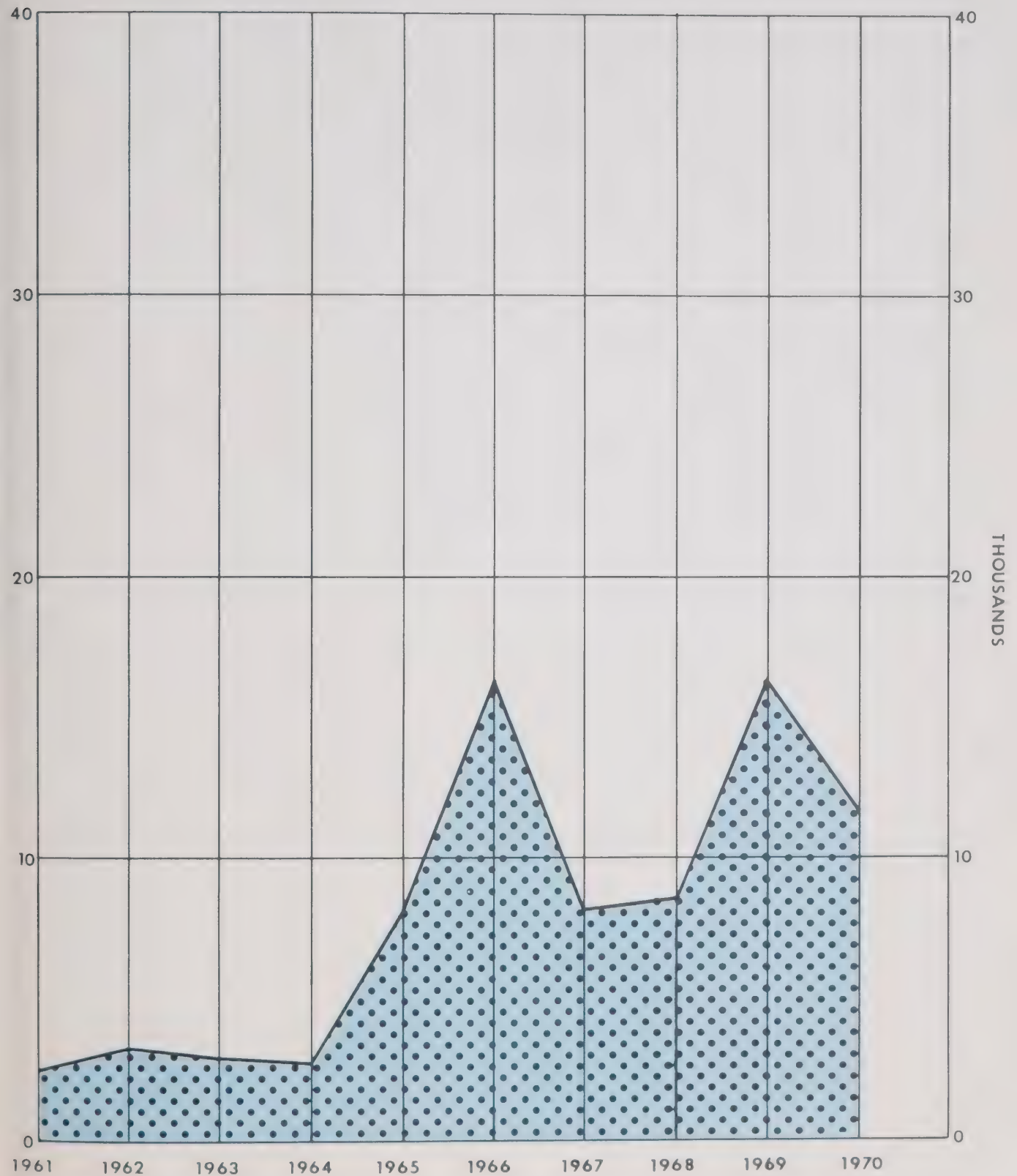
(c) Cumulative Totals — 1886 to December 31, 1970

(d) Figures for years 1932, 1943, to 1953 not available.

MINERAL CLAIMS RECORDED — NORTHWEST TERRITORIES



MINERAL CLAIMS RECORDED — YUKON TERRITORY



Notes

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Branch

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**Mining Activity in the Yukon and
the Northwest Territories**

Issued under the authority of
Hon. Jean Chrétien, PC, MP, Minister of
Indian Affairs and Northern Development

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Introduction

There was a significant increase in the value of mineral production for the Yukon Territory during 1971, reaching an all time high of \$94,031,000; whereas in the Northwest Territories the value of production dropped from \$132,637,613 in 1970 to \$98,132,000 in 1971. Total value for both Territories was \$192,163,000; a decrease of \$17,986,546, or 9 per cent from the 1970 value of \$210,149,546. The decrease for the N.W.T. was due primarily to fewer sales and lower metal prices, particularly for lead, silver and gold and to a poorer grade of ore being mined at one large producer.

This department continues to encourage exploration under the various assistance programs, including the Northern Mineral Exploration Assistance, the Prospectors Assistance and Roads and Airport Assistance. Also, in keeping with modern exploration and development techniques, changes in legislation are contemplated in both the Yukon and the Northwest Territories to streamline procedures for the acquisition of mineral rights. The government also intends to expand its facilities for providing scientific advice to industry, and core storage libraries are being set up in both Territories. In co-operation with the Department of Energy, Mines and Resources, scientific studies will be made of areas under exploration. Reconnaissance surveys were down during 1971, although there was considerable property examination and exploration.

Numbers in parenthesis throughout book refer to location of activity area on accompanying mineral exploration and mining map.



Northwest Territories

Producing Mines

As reported by Statistics Canada, mineral production in the Northwest Territories for 1971 was \$98,132,000. This is a 26 per cent decrease on the 1970 value of \$132,637,613. The drop in value of production was due mainly to a drop in silver and lead prices of 15 per cent and a falling off in sales of lead and zinc.

The 6 producing mines, 2 open pit and 4 underground operations, processed 4,710,521 tons of ore and employed 1,350 workers.

Gold

Giant Yellowknife Mines Ltd.

Site:	1.5 miles north of Yellowknife
Rate:	1,100 tons a day (including ore from adjoining Supercrest and Lolor properties)
Tons milled:	267,128
Grade:	0.612 ounces of gold per ton
Reserves:	441,900 tons grading 0.6602 ounces gold per ton
Employees:	388 (see also Supercrest Mines Ltd.)

Supercrest Mines Ltd.

Site:	1.5 miles north of Yellowknife and adjoining the Giant mine
Rate:	approximately 168 tons a day
Tons milled:	61,482
Grade:	0.667 ounces of gold per ton
Reserves:	123,800 tons, grading 0.70 ounces gold per ton
Employees:	(operated by Giant mine)

This property adjoins and interconnects with the Giant workings. It is operated jointly by Giant Yellowknife Mines Ltd. and Akaitcho Mines on a 50-50 basis.

Lolor Mines Ltd.

Site:	1.5 miles north of Yellowknife, and is an extension of the Giant workings
Rate:	approximately 206 tons a day
Tons milled:	75,209
Grade:	0.606 ounces of gold per ton
Reserves:	133,100 tons grading 0.66 ounces gold per ton
Employees:	(operated by Giant mine)

This property is 87.5 per cent owned by Giant Yellowknife Mines Ltd. There is no shaft on the property and the underground workings are an extension of the Giant holdings.

Con-Rycon-Vol Mines Ltd.

Site:	1.5 miles south of Yellowknife
Rate:	434 tons a day
Tons milled:	158,480
Grade:	0.576 ounces of gold per ton
Reserves:	3 years at present rate of production
Employees:	216

Tonnage milled was up 8 per cent; however, production was up only 3 per cent. Mining is carried on from the 3,100 foot level to the 4,500 foot level. The area from the 4,500 to 4,900 foot level is under extensive development. The C-2 shaft winze was completed during the year from 4,900 to 5,600 feet and about 1,000 feet of lateral development was carried out. Work off this shaft ceased in October. However, the downward continuation of ore bodies is assured and reserves can be developed as needed.

Lead-Zinc

Pine Point Mines Ltd.

Site:	south of Great Slave Lake, 50 miles east of Hay River, N.W.T.
Rate:	11,154 tons a day
Tons milled:	3,892,000
Grade:	2.6% lead, 6.5% zinc
Reserves:	41.9 million tons with an average grade of 2.4% lead and 6.0% zinc
Employees:	504

Tonnage processed was somewhat higher than for 1970 but the grade dropped by 9 to 12 per cent. Markets were good for zinc but soft for lead; some of the lead concentrates were stockpiled. Over-all value of production was some 25 per cent below that of 1970.

Underground work on the M-40 ore body was stopped in March. No decision has yet been made to mine this ore body or by what method.

Land acquisition, exploration and development continue in the immediate vicinity with some success. It is expected that additional ore reserves will be developed.

Silver-Copper

Echo Bay Mines Ltd.

Site:	Great Bear Lake
Rate:	98.6 tons a day
Tons milled:	35,985
Grade:	55 ounces of silver per ton
Reserves:	2 years at present rate of production
Employees:	136

Situated on Great Bear Lake this mine produced throughout the year at a rate of 100 tons a day. Silver grade was down to 55 ounces per ton, a drop of 23 per cent; however, the dollar value of silver production was down only 3 per cent. Exploration and development continued at the lower levels on the projection of a downward extension of ore bodies.

Terra-Mining and Exploration Ltd.

Site:	40 miles south of Great Bear Lake
Rate:	133.5 tons a day
Tons milled:	48,714
Grade:	41.4 ounces of silver per ton and 0.8% copper
Reserves:	not available
Employees:	70

Terra is operating an underground mine at Rainey Lake some 40 miles south of Great Bear Lake. The ore is a silver-copper bismuth deposit. Due to breakdown of diesel power plants, all mining and milling was shut down in December. The value of silver production increased remarkably in the latter part of the year due to higher grade of silver being worked at the third level.

Tungsten-Copper

Canada Tungsten Mining Corporation Ltd.

Site:	125 miles north of Watson Lake, Y.T.
Rate:	490 tons a day
Tons milled:	181,596
Grade:	1.19% WO ₃
Reserves:	443,700 tons at 1.36% WO ₃
Employees:	83

Canada Tungsten has increased its production rate to 490 tons of ore a day. Due to the severe winters the open pit is worked only during the summer months and ore is stockpiled for year-round milling. During the year exploratory work in the vicinity of the mine was encouraging and it is anticipated that additional reserves will be developed and prolong the life of the mine.

Developing Mines

Cadillac Explorations Ltd., which owns a silver-lead property on Prairie Creek in the Nahanni Mining District, optioned its property to Penarroya Canada Limitée.

During June and July, Penarroya completed 1,155 feet of lateral development and 331 feet of raising to establish the vertical continuity and determine grade of the ore zone. Feasibility studies are now being done. Production from this property hinges on the development of adequate transportation facilities from the mine to railhead.

Federated Mining Ltd. has been rehabilitating the old White Eagle Mines on the Camsell River. Mill heads estimated at 100 ounces of silver to a ton but ore reserves are very limited and quoted at 5,000 tons. Production was scheduled for February 1972.

Exploration

Mineral exploration in the Northwest Territories continues to be directed primarily towards the discovery of significant base metal or uranium deposits. Work was concentrated in the greenstone belts north of Yellowknife in the Hackett River area, on Little Cornwallis and Cornwallis islands and in the Camsell River area, but projects were under way from the Redstone River and MacMillan Bay in the Mackenzie Mountains to the Cumberland Peninsula on Baffin Island. The number of claims staked within the Northwest Territories dropped substantially during the year to less than 9,000, but 41 prospecting permits covering over 2,500,000 acres, were issued.

Lead-Zinc

Perhaps the most exciting development during the year was the discovery of lead and zinc deposits in the Territories.

Arctic Islands

In August 1971 *Cominco Ltd.* announced significant intersections of lead and zinc mineralization from the Polaris drilling site on Little Cornwallis Island (17) a property jointly owned by *Cominco Ltd.* and *Banker Mines Ltd.* Intersections from nine drill holes include a section 410 feet long which graded 22.87 per cent combined lead and zinc. This is the second major drilling program conducted by these firms on this island. The first, in 1965, on the Eclipse showing, a few miles to the northeast, revealed 900,000 tons averaging 13 per cent zinc and 2 per cent lead to a depth of 100 feet.

In addition to its drilling activities *Cominco Ltd.* carried out geological mapping, prospecting, geochemical surveys and Winkie drilling on other prospects on Cornwallis Island and smaller neighbouring islands.

A prospecting program which included some geological mapping was conducted in the Milne Inlet-Tremblay Sound area of northern Baffin Island for *PCE Explorations Ltd.* (18).

Mackenzie Mountains

The southern Mackenzie Mountains (19) were prospected for lead and zinc showings by parties working for *Cominco Ltd.* and *Texas Gulf Sulphur Co. Inc.* As a result of these studies, one major discovery in northeastern British Columbia was announced by *Texas Gulf Sulphur Co. Inc.*

Penarroya Canada Ltée continued to investigate its Prairie Creek property, which was worked under option from *Cadillac Explorations Ltd.*, by driving a second adit beneath their No. 1 adit and collecting bulk samples. *Penarroya* also conducted geochemical surveys and a trenching program on its claims south of the Nahanni River (20).

Cominco Ltd. examined an occurrence of lead and zinc mineralization at the mouth of Wrigley River (21).

Hackett River Area

As a result of work completed in 1969 and 1970 by *Bathurst Norsemes Ltd.* and its predecessors, and *Cominco Ltd.* on the Bathurst Norsemes property in the Hackett River area, 45 miles southwest of the head of Bathurst Inlet (22), a minor staking rush occurred in the spring and over 2,000 additional claims were registered in this area.

Cominco Ltd. returned to the Bathurst Norsemes property and continued tests by drilling of geochemical and electromagnetic targets established in 1970. Over 10,000 feet of diamond drilling was done along a belt over 7 miles long. Several holes penetrated interesting mineralization and further work is contemplated.

Geological surveys over the main ore zone by *Cominco Ltd.* and Geological Survey of Canada geologists suggest that the mineralization lies in tuffaceous felsic volcanics near alteration pipes cutting the formation underlying the ore deposit. *Cominco Ltd.* optioned the ZED claims from *Ice Station Resources Ltd.* and the T claims of *Spectroair Explorations Ltd.* and conducted geophysical and geochemical surveys over these claims. These surveys were then followed by drilling of the best anomalies.

Other companies which conducted geophysical surveys over their claims in this area include *Freehold Gas and Oil Ltd.*, *Cleaver Lake Mines Ltd.*, *Northair Mines Ltd.*, and *New Cronin Babine Mines Ltd.*

In addition, much prospecting and some geological mapping was done over the claims surrounding the Bathurst Norsemes property.

Pine Point Area

Cominco Ltd. continued systematic drilling on its extensive holdings in this area. It continued to test new IP techniques and to acquire promising ground to the east and south of its present properties.

Other Areas

Newmount Mining Corp. of Canada Ltd. attempted a geochemical survey in the area between Rae and Lac La Marte (23) but was hampered by deep snow and overburden.

Cominco Ltd. conducted preliminary studies over its MTN and IND claim groups on Brisbane Lake (24), a few miles north of the known mineral deposit owned by *Indian Mountain Metal Mines.*

In the same area *Shield Resources Ltd.*, *Vestor Explorations Ltd.* and *Numac Oil and Gas* conducted a ground electromagnetic and magnetic survey over the Susu Lake greenstone belt (24). Two conductors were found and staked.

Copper

Exploration for copper and associated base metal deposits continued at a steady pace.

Coppermine River – Bathurst Inlet Areas

Coppermine River Ltd. conducted a summer-long geochemical survey in the vicinity of its Hope Lake deposit and the Teshierpi Fault (25). Its purpose was to evaluate the high copper occurrences in some lake-sediment samples taken by Geological Survey of Canada field parties in 1969 and 1970.

Oakwood Petroleum Ltd. did detailed geological, geophysical and geochemical surveys on portions of its 2 permit areas straddling the James River (26), 20 miles south of copper-zinc deposits of *Kennco Exploration (Canada) Ltd.*

Back River Area

Central Arctic Copper Ltd. (now Tri Jet International Ltd.) completed 5 holes totalling 1,471 feet on a copper prospect in a greenstone-sediment contact at the northern end of Muskox Lake (28).

Texas Gulf Sulphur Co. Inc. conducted a preliminary geological evaluation of the acid volcanics between the Back River and Nose Lake (27). During the summer

months several groups including *Hunt Explorations Ltd.* examined by prospecting, geological and geophysical surveys several gossan zones north of Regan Lake (28) for gold and base metal deposits.

Yellowknife Area

Shield Resources Ltd., *Numac Oil and Gas Ltd.* and *Getty Mines Ltd.* continued their investigation of the Beaulieu River greenstone belt (42) for base metals. A total of 8,000 feet of drilling was done on several geophysical anomalies identified in 1970 as a result of aerial surveys. Mineralized zones up to 100 feet wide and several thousand feet long were detected by the drill, but assays were poor. Drilling was supplemented by ground geophysics, geological mapping and geochemical surveys.

In the same area, *Giant Yellowknife Mines Ltd.* examined a gossan zone south of Spencer Lake (42) by a ground electromagnetic and magnetometer survey and by trenching and sampling.

Cleaver Lake Mines Ltd. completed a ground geophysical program over its BAY claim group east of Lockhart Lake. The work was supported by a geological and geochemical survey. Targets for drilling were selected but no drilling was done.

The Yellowknife Syndicate managed by *Geophysical Engineering and Surveys Ltd.* conducted an extensive ground follow-up program consisting of ground geophysics, geological mapping and trenching over most of its 401 claims staked late in 1970 as a result of a DIGHEM aerial survey. The claims lie north and south of *Shield Resources Ltd.* ground in the Beaulieu greenstone belt (42).

Northgate Exploration Ltd. in partnership with *Anglo United Development Corp. Ltd.* did geological mapping, ground geophysics and some Winkie-type drilling on several showings within greenstone and associated volcanics in the vicinity of Rivett Lake and Camsell Lake.

To the northwest of Yellowknife in the vicinity of Indin Lake (45), *Freeport Canadian Exploration Co.* conducted a ground geophysical survey over its claim group staked in 1970 as a result of an aerial survey. It then drilled several holes totalling 2,266 feet on the VAN and JAN claim groups. Copper values, while consistent, were low.

Great Plains Development Co. of Canada Ltd. flew an aerial survey using Questor equipment over portions of the Beaulieu River greenstone belt, the entire Cameron River greenstone belt and the southern and eastern portions of the Indin Lake greenstone belt. A total of 1,000 claims was recorded, the majority being in the vicinity of Wijinnedi Lake (45). Geological prospecting and mapping followed the acquisition of these claims.

East Arm, Great Slave Lake Area

Hudson Bay Oil and Gas Co. Ltd. examined in detail an ANN group of claims 8 miles west of Reliance (47). TURAM survey, ground electromagnetic surveys, geological mapping and prospecting and a study of previous drilling results failed to reveal significant deposits of base metals. The company flew an aerial geophysical survey over the eastern end of the East Arm on both sides of the McDonald Fault and examined the anomalies on the ground.

Giant Yellowknife Mines Ltd. mapped its DAISY claim group on a lake 15 miles southwest of Reliance and east of the McDonald Fault (47). No significant mineralization was found.

An Alberta syndicate mapped the geology and did a magnetometer survey of the BBX claims at Taltheilei Narrows (46), a property which contains some excellent copper values in surface trenches.

Keewatin District

The Aquitaine Co. of Canada Ltd. conducted a comprehensive geophysical and geological prospecting program on its holdings in the Keewatin area during 1970. In the Ketyek River area (31), magnetometer and electromagnetic surveys were completed and a drill tested gossan zones and a geochemical anomaly detected in 1970.

On the southern part of Melville Peninsula (32) *Scintrex Ltd.* conducted airborne geophysical surveys over portions of the permit areas granted Aquitaine in 1970. These surveys were followed up by some drilling along a belt of gossans 4 miles long and up to 1,000 feet wide in an area underlain by paragneiss and schist.

Headframes and surface plant at Giant Yellowknife Mines, veteran gold producer at Yellowknife, N.W.T.



Aquitaine also completed airborne geophysical surveys northeast of Wager Bay (29) over 4 permit areas granted in 1971. Ground prospecting and some Winkie drill holes tested some of the ultrabasic bodies in this area and a series of gossans associated with magnetite iron formation within these areas.

In the Carr Lake area (33) *Canadian-Superior Exploration Ltd.* completed an aerial geophysical survey over 10 permit areas. The aerial survey was supplemented by 2 prospecting parties on the ground which investigated anomalies found during the geophysical surveys.

Penarroya Canada Ltée. continued investigation of its permits and claims in the Ferguson River – Tavani area (34). A TURAM survey and some geological mapping were completed and some of the best targets were drilled. In the late summer an airborne geophysical survey was completed over 2 permits acquired in 1971.

Five Star Petroleum and Mines Ltd. were active on its claims in the Pistol Bay and Rankin Inlet areas (35). Geophysical surveys and a drilling program were completed during the year.

Baffin Island

The Aquitaine Co. of Canada Ltd. was active on Baffin Island where it investigated gossans in the central portion of the island (36), and commenced an airborne geophysical survey of 18 newly acquired permits on the Cumberland Peninsula south of Pangnirtung (40).

Canadian Nickel Co. Ltd. conducted a geological reconnaissance of central Baffin Island (36) from Dewar Lakes to the vicinity of Milne Inlet.

Other Areas

A major exploration program was conducted in the Redstone River area in the vicinity of Coates Lake (39) by *Cerro Mining Co. of Canada Ltd.* on a stratigraphically controlled copper deposit found in the early 60s by the *Nahanni Syndicate* (now *Redstone Mines Ltd.*). Four deep diamond drill holes were put down: 2 to a depth of 2,000 feet near the south end of the deposit and 2 shallower holes about 4 miles to the north. The purpose of the project was to delineate a flat-lying section of the copper-bearing Jean-Marie Formation. A geochemical survey and geological mapping were done in addition to the drilling.

Several companies including *Getty Mines Ltd.* and *Newmont Mining Corp. of Canada Ltd.* showed interest in possible deposits of copper in the porphyritic rocks of the Bear Province southeast of Great Bear Lake (37).

David Minerals Ltd. continued its investigation over the FD claims on Salkeld Lake (38).

Silver

Great Bear Lake – Camsell River Area

The presence of 2 producing silver mines (*Echo Bay Mines Ltd.* and *Terra Mining and Exploration Ltd.*) and developing properties (*Norex Resources Ltd.* and *Federated Mining Corporation Ltd.*) spurred the search for silver in this area (44).

Echo Bay Mines Ltd. commenced a review of all known silver and uranium showings within this area.

Jason Explorers Ltd. completed a program of geological mapping and trenching on its MAG claims. *D. E. Arden* completed similar work over his AM and SA claim groups.

Federated Mining Corp. Ltd. and *Quint Holdings Ltd.* investigated the ground north of Federated's property on the Camsell River. Some drilling was done to test a quartz vein on the STAR and COMET groups; a magnetometer survey was completed on the FOX and WAS claims and a study of the known mineral showings was completed on the WOLF and ROSE groups.

Tobe Mines Ltd. completed an airborne radiometric survey over the CARIBOU and MOOSE groups.

Baron's Oil Ltd. conducted geophysical surveys and a prospecting and trenching program over its REX claim in the vicinity of White Eagle Falls on the Camsell River.

Vestor Explorations Ltd. began a geological study of the Bay Group rocks in the Camsell River area in an attempt to determine ore contacts.

Other Areas

Silver was discovered between the La Roche River and Great Slave Lake (43) by a prospecting syndicate headed by F. Diamion of Hay River. Good values were obtained along a northeast-striking fracture in a mixed assemblage of highly sheared and metamorphosed rocks between two of the major faults of the McDonald Fault System. This is one of the first silver showings reported from rocks of the Churchill Province south of the East Arm Area of Great Slave Lake.

Gold

In the Yellowknife area (41), *Giant Yellowknife Mines Ltd.* continued its studies over the prospects of *Northbelt Yellowknife Mines Ltd.* immediately to the north of Giant's workings. Structural, petrographic and geochemical studies are being used to evaluate this property. South of the town-proper *Con Mine* continued its investigation of the *Yellowrex Mines Ltd.* property by drilling from a drift driven from the Con workings south through the Yellowrex claims.

Sturdy Mines Ltd. and *Talisman Mines Ltd.* completed a 7 hole drill program on the TIP and NUT claims on the west shore of Lac du Rocher (42).

As the price of gold continued to rise towards the end of the year, much interest was shown by Yellowknife prospectors in some of the gold showings north of Yellowknife.

Uranium

Interest in prospecting for uranium suffered a sharp decline in 1971, but several companies continued work on known showings, especially in the East Arm of Great Slave Lake and at Baker Lake.

East Arm Area

Vestor Explorations Ltd. actively explored its extensive holdings in the rocks of the Sosan Group in the East Arm. On North Simpson Island (70), 4,794 feet of drilling were completed in the spring of this year on its Zone 5, the most promising of the 1970 discoveries. During the summer 6 other zones of uranium mineralization were tested by the drill, and geological studies were continued as to the cause and controls of the mineralization. At Toopon Lake near Snowdrift (75), radiometric surveying and mapping outlined 3 distinct zones of uranium mineralization. In the Reliance area (47), prospecting and mapping revealed a new mineralized zone from which samples grading up to 6.7 per cent U^3O_8 have been recovered.

Great Plains Development Co. of Canada Ltd. conducted geological prospecting and ground radiometric surveying over its claim blocks in the Snowdrift area (57) and the Reliance area (47). R. Steiner of Hay River drilled 8 holes totalling 306 feet into a granodiorite body on the CC claim group adjacent to Cliff Bay (47).

Nonacho Area

Imperial Oil Enterprises Ltd. carried out mapping and trenching work on the BEN group of claims, 5 miles east of Walker Lake (48) where pitchblende has been detected in a shear zone striking southeast.

Nissho-Iwai Canada Ltd. performed ground radiometric surveys, geological mapping, prospecting and trenching on a newly discovered pitchblende deposit on the east shore of the northern segment of Nonacho Lake (48). The uranium mineralization is associated with northeast-striking brecciated quartz-filled fault and shear zones.

G. V. Lloyd Ltd. conducted prospecting of the LOX claim group on the Thubun River (49).

Getty Mines Ltd. continued its examination of the area east of Nonacho Lake, in the vicinity of Lynx Lake (50). In 1970 the company completed an aerial survey of this region. In 1971 it conducted ground radiometric surveys and, where necessary, geological mapping and trenching.

Baker Lake Area

The Dynamic Group of Companies (now Pan Ocean Oil Corp.) continued its investigation of uranium mineralization found in the preceding two summers. A low-level, high-sensitivity magnetometer survey was flown over portions of its property and claims in June 1971. This was followed by ground scintillometer and magnetometer surveys, geochemical surveys and geological mapping of areas of particular interest. In the fall of the year, drilling was conducted in the vicinity of the Kazan Falls (51).

Nickel

Perry River Area

Giant Yellowknife Mines Ltd. conducted an extensive aerial geophysical survey over 7 permits received in 1971 which stretch southward from the mouth of the Perry River to MacAlpine Lake (52). The aerial survey flew east-west and north-south lines at one quarter mile spacing in an attempt to delineate source areas for high-grade nickel-copper float discovered the previous season.

To the east of Giant's permits the *Perry River Syndicate* continued prospecting for additional sources of copper-nickel mineralization. Several showings were found and in November *Savannah Creek Gas and Oil Ltd.*, and *Rio Alta Exploration Ltd.* staked almost 800 claims to protect these showings and their possible extensions.

East Arm Area

Zig Mines Ltd. geologically mapped a niccolite showing on the ZIG claims at the mouth of the Beaulieu River (33). The property was formerly staked as a gold prospect.

Five Star Petroleum and Mines Ltd. completed nearly 4,000 feet of drilling on Easter Island (33). The program was designed to investigate a nickel-silver occurrence at the base of a differentiated intermediate-to-basic dyke.

Darnley Bay Area

Northgate Exploration Ltd. mapped portions of its claim block over the Darnley Bay gravity high (55). An airborne electromagnetic and magnetometer survey completed in 1970 was used as a guide to the mapping. *Arjay Kirker Resources Ltd.* reserved 2 permits adjacent to the Northgate claims and efforts are being made to initiate deep drilling in an attempt to reach the top of the basic or ultrabasic body which almost certainly is the cause of this tremendous gravity high.

Other Minerals

Canada Tungsten Mining Corp. Ltd. continued exploration in the vicinity of its mine property and were successful in delineating a possible second orebody 1,800 feet north of the northern limits of the present deposit.

Trans-Canada Resources Ltd. drilled 4 holes to test for a possible horizon of bentonite, 12 miles north of Inuvik (54).

Coal seams were examined during the year in the Fort Norman area (65) and in the southern Mackenzie Mountains (19).

Beryl, pollucite and tungsten-bearing pegmatite veins were examined by prospectors northeast of Yellowknife. As yet no commercially workable deposit has been delineated.

An occurrence of fluorite was staked by *Great Plains Development Co. of Canada Ltd.* in the Schist Lake area (75) south of the MacDonald Fault some 25 miles east of Snowdrift.

Producing Mines

There were 6 producing mines in the Yukon at the beginning of 1971, 2 of which ceased operations during the year. However, one is expected to resume production in January of 1973.

As reported by Statistics Canada, the value of mineral production in the Yukon increased from \$77,511,933 in 1970 to \$94,031,000. The increase was largely due to increases in production and sales of zinc, lead and silver.

Silver-Lead-Zinc

Anvil Mining Corporation Ltd.

Site:	130 miles northeast of Whitehorse
Rate:	7,299 tons a day
Tons milled:	2,673,000
Grade:	4.9% lead, 6.8% zinc, 1 ounce silver per ton
Reserves:	58,404,000 of 9% combined lead-zinc
Employees:	358

This company had an exceedingly good year, increasing its rate of production to 7,300 tons a day from 6,600 tons a day in 1970.

United Keno Hill Mines Ltd.

Site:	31 miles northeast of Mayo
Rate:	260 tons a day
Tons milled:	94,754
Grade:	31.8 ounces silver per ton, 4.47% lead, 3.83% zinc
Reserves:	86,470 of 51.6 ounces per ton silver, 5.3% lead, 2.4% zinc.
Employees:	286

United Keno Hill continued milling throughout the year at a rate of 260 tons a day with ore from the Calumet, Husky and Elsa mines. Exploration and development work continued at the No Cash mine on Galena Hill and on several other properties on Keno Hill.

Asbestos

Cassiar Asbestos Corporation Ltd.

Site:	50 miles northwest of Dawson City
Rate:	4,800 tons a day
Tons milled:	1,447,863
Grade:	5.37% fibre
Reserves:	18,750,000 tons
Employees:	226

Production remained normal at this mine. Asbestos fibre production for the year amounted to 92,500 tons.

Copper

Whitehorse Copper Mines Ltd.

Site:	7 miles south of Whitehorse, Y.T.
Rate:	2,300 tons a day
Tons milled:	337,758
Grade:	1.02% copper
Reserves:	2,702,274 tons of 2.38% copper
Employees:	200

This company, which was formerly New Imperial Mines Ltd., ceased open pit mining and milling in June 1971 because of a decline in world copper prices which made the operation uneconomical. Development work continued on the richer ore which is a downward extension of the Little Chief and Middle Chief ore bodies. Reserves of underground ore are estimated at 2,700,000 tons, grading 2.38 per cent copper.

Gold-Silver

Venus Mines Ltd.

Site:	18 miles southeast of Carcross, Y.T.
Rate:	250 tons a day
Tons milled:	41,435
Grade:	0.39 ounces gold and 11.5 ounces silver per ton, 1.67% zinc and 0.93% cadmium
Reserves:	110,000 tons
Employees:	60

This property came into production in September 1970 and for economic reasons was shut down in June 1971 after less than a year of operation.

Coal

Tantalus Butte Coal Mine

Site:	Carmacks, Y.T.
Rate:	83 tons a day
Tons milled:	21,026
Grade:	Thermal coal
Employees:	16

The mine is operated by Anvil Mining Corporation and continued mining at a rate of 83 tons a day using native labour. Coal is used by Anvil for drying of lead-zinc concentrates.



Mining Development

Nickel-Copper

Hudson-Yukon Mines Ltd., wholly owned subsidiary of Hudson Bay Exploration and Development Company, continued with rehabilitation of underground workings on its property at Mile 1111 on the Alaska Highway. Construction of mill, power-house, ore and waste bins was completed during the year. Due to some underground problems, however, opening of the mine was delayed and production is expected to begin later in 1972. Concentrates from this operation will be sold to Sumitomo Metal Mining Co. of Japan.

Exploration

During 1971 exploration in the Yukon consisted of continuing detailed examination of known areas of mineralization. Detailed geological mapping and diamond drilling was carried out in the Anvil-Vangorda area by several companies. The Dawson Range Syndicate, United Keno Hill Mines, Silver Standard Mines and others explored what appears to be developing into a major copper mineral district north of Carmacks on the west side of the Yukon River.

Silver-Lead-Zinc

In the Anvil area, (8) Anvil Mining Corporation completed 18,000 feet of development drilling in 200 holes. Dynasty Exploration Limited continued work on the GRAN, JEAN, LORNA, ARO and ROTO claim groups of the Tintina Project, carrying out ground magnetometer, EM, gravity and geochemical soil surveys with follow-up drilling. Adjacent to replacement lead-zinc deposits, these operations are immediately northeast of the Tintina Trench and close to the Anvil Batholith. In this same area Canadian Reserve

Oil and Gas, through Overland Exploration Services, performed gravity surveys on its claims, ARROW, MARK and LEE; drilling was completed in late 1971. On its ACME claims to the southeast Dynasty carried out ground geophysics – a follow-up to 1966 airborne work. Pacific Petroleum Limited did IP surveys on part of Hecla Mining land in this area. Extensive drilling is planned for 1972 on geological-geophysical targets in the Tintina Project.

On the SWIM LAKES property southeast of the Anvil Mine, Kerr Addison did a further 2,500 feet of diamond drilling, intersecting minor amounts of lead-zinc. Further still to the southeast, Citex Mines Limited did a magnetometer survey on the HOWARD LAKE group.

On the south side of the Tintina Trench Kerr Addison performed a gravity survey (16).

To the north of the Anvil Mine, Kangaroo Explorations Corporation Limited performed an IP survey on the gravity anomaly detected in 1969 on the MT. MYE property's ZAN-JET claims and drilled 1900 feet.

Nearby, on the TRY claims, Spartan Explorations Limited did an IP survey in graphite-pyrite-pyrrhotite-rich rock. Further IP and gravity surveys are recommended to direct possible drilling.

In the Rancheria area, (56) Wolf Lake Joint Venture continued work on their H claim group, pursuing the sulphide- and scheelite-bearing skarn by geological mapping and geochemical sampling. To the southeast Boswell River Mines did a Turam survey on the LUX-OMO claims, and did 1,600 feet of drilling on the resulting conductors; minor silver-lead was found and work is expected to continue. South of the Alaska Highway, Mark V Mines did orientation geochemistry to locate further galena occurrences on their L-LOLA claims.

The MATT BERRY property (57) on East Arm Frances Lake, held jointly by CANICO, Metallgesellschaft and Matt Berry Mines Limited, was mapped, surveyed by IP and drilled in 1970; work was continued in 1971 with silt geochemical, geology and EM surveys over galena-sphalerite-bearing siliceous phyllites. East of Frances Lake, Welland Consolidated Mining Limited carried out magnetometer and geochemical surveys on its VAGAS claims yielding minor zinc anomalies.

In the Hess Mountains, (58) Atlas Explorations with Quebec Cartier Mining and Engelhard Minerals continued work on the SCOTT group of 1967 vintage, performing gravity and geochemistry surveys in late 1970 and in 1971. They are said to be planning drilling for 1972.

In the MacMillan Pass, (59) Hudson Bay Exploration and Development Company Limited completed the major underground exploration work of 1970 with 2,000 feet of underground diamond drilling on the TOM property as well as general prospecting in the area.

To the east of the Shakwak Trench, (60) in the southwestern Yukon, Charta Mines carried out geochemistry following trenching on the GREEN EAGLE property in late 1970.

On the CLARK claims (61) north of Keno Hill, Bullion Mountain Mining Company Limited performed further gravity surveys, carried out systematic drilling to outline grade and tonnage of the known mineralized zone, and directed exploratory drilling elsewhere.

Lacanex Mining Co. Ltd. did a block aeromagnetometer survey along the McQuesten River north of Elsa in 1970.

Copper-Molybdenum

In the Dawson Range, (62) Silver Standard Mines Limited, in conjunction with ASARCO, drilled 7 holes near Minto on geochemical anomalies. Adjacent to this prospect, United Keno Hill Exploration discovered a prominent copper geochemical anomaly on which they did EM and ground magnetometer surveys. In late 1970 Acroll Oil and Gas carried out aeromagnetometer surveys on the CANADIAN CREEK property. Also in late 1970 Montana Mines Limited did reconnaissance soil geochemistry on the AXE and HILL claims in the Rude Creek area. Delta International Minerals, in November 1970, found lead-silver soil anomalies and weaker copper-molybdenum highs on the HAYES group. In 1970 on the SOMME property (TOM claims) of Dawson Range Joint Venture minor soil anomalies were discovered. Occidental Minerals Corporation of Canada did soil geochemistry on the PRO claims yielding anomalous patterns. On their TRI and TOP claims Kennco Explorations (Western) Limited, recognized molybdenum soil anomalies in an area underlain by plutonic and extrusive igneous rock. Charta Mines Limited carried out geology, geochemistry and magnetometer surveys on its CHART claims group and found copper and molybdenum highs. The company plans more intensive work.

Northeast of the Dawson Range, Occidental Minerals Corporation of Canada did a soil geochemical survey on its PELLY claims. An IP survey was completed on part of the property in early November.

To the southwest of the Dawson Range, Occidental carried out soil geochemical surveys on the KLOT and CHRIS claim groups overlying a molybdenite and chalcopyrite bearing intrusive complex.

On the White River (63) northwest of the Dawson Range, Marguerite Lake Mines Limited did airborne magnetometer explorations of its LIBRA claims.

Further to the northwest, Occidental, in 1970, did soil geochemical studies finding copper and molybdenum highs on the LAD claims near the Alaskan boundary.

To the south of Dawson Range, (64) Imperial Oil Enterprises (Trigg-Woollet and Assoc.) with Atlas Exploration and Dynasty Explorations, did drilling on the MAX claim on Rhyolite Creek. Drilling is expected to continue on molybdenite occurrence.

Further to the south of Dawson Range, (64) on the T Project where Phelps Dodge did 200 feet of drilling in 1970, further drilling in 1971 ended in disappointing results. On their Alaskite Project it discovered molybdenite. They carried out a geochemical project and took chip samples.

Near Aishihik Lake (64) on Mitsubishi Metal Mining Company's KL groups 7 drill holes totalling 2,600 feet revealed copper and molybdenum. This and the AD groups were the subject of IP and soil geochemistry surveys in 1970.

BC-Yukon Exploration Company Limited (66) recommended, in April 1971, trenching and/or drilling and extended a geochemical survey to cover a molybdenum area near Tagish Lake on the B.C. boundary at the previously drilled LIME CREEK property. Premier Resources Limited (formerly Premier Mining Corporation Limited) did surface prospecting, soil surveys, trenching and mapping on the LULU claim on Windy Arm of Tagish Lake.

Copper-Zinc

In the Rancheria area, (56) Boswell River Mines Limited did extensive work on the Swift River-Burnt Hill property adjacent to their silver-lead-zinc OMO claim. Following earlier ground magnetometer surveys, trenching and drilling on the DAN claims and soil geochemistry and geological mapping being done late in 1970, magnetometer and EM surveys were flown over 10 square miles.

Copper

In 1970 in the Whitehorse area, New Imperial Mines carried out soil geochemistry on COWLEY PARK, WAR EAGLE and BEST CHANCE claims. Reconsideration of the geochemical results with geological data was recommended. In 1971 this work was followed by IP exploration on WAR EAGLE fraction and JIM, GENO, NEW, PRINCE and S. SNELL claims and resulted in the delineation of 2 drill targets and areas for further work.

Pictures of the Past

1 Hudson's Bay Company boat "Hearn Lake" and scow at Cameron Bay, Northwest Territories, bringing in supplies for Eldorado Gold Mines and the District Government Recording Office in 1935. (Photo by M. Meikle)

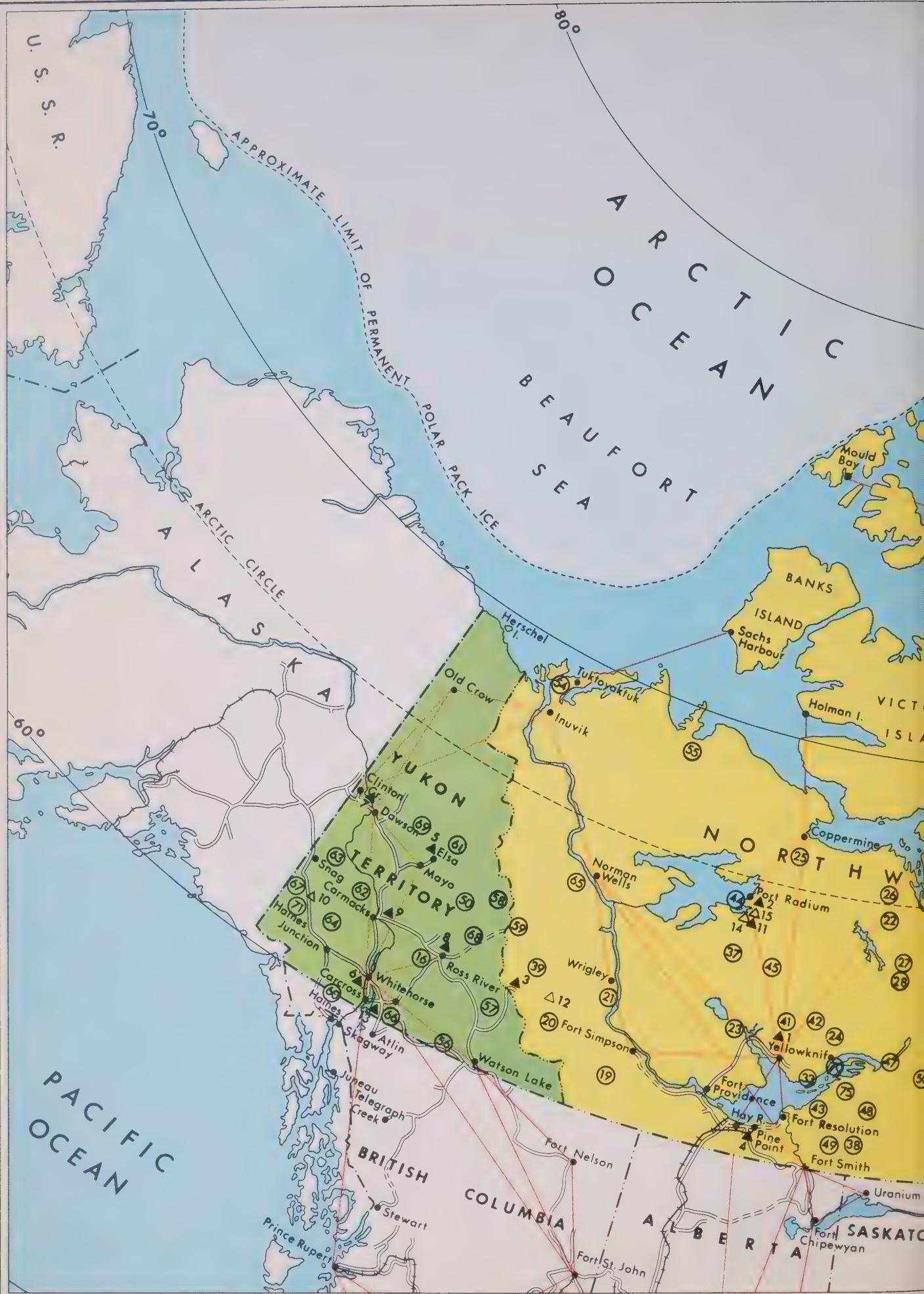
2 Eldorado Gold Mines operating a radium-silver mine at Great Bear Lake, Northwest Territories, 1935. (Photo by M. Meikle).

1



2





MINERAL EXPLORATION AND MINING - YUKON & N.W.T.



LEGEND

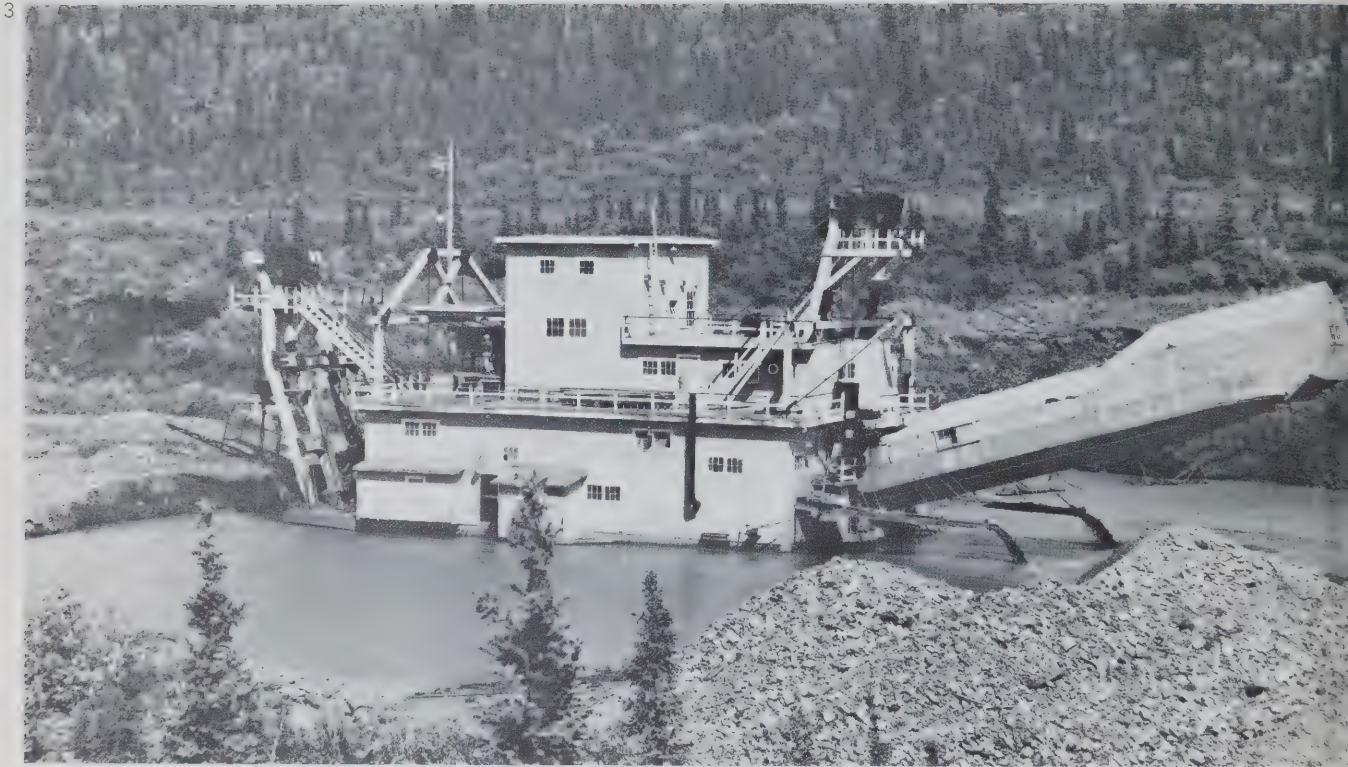
- | | |
|---------------------|------------------------|
| ▲ PRODUCING MINE | +++ RAILWAY |
| △ DEVELOPING MINE | — COMMERCIAL AIR ROUTE |
| ⊙ AREAS OF ACTIVITY | |
| — EXISTING ROAD | |

- | | |
|--|-----------------------------------|
| 1 Giant Yellowknife Mines Ltd. Au | 9 Yukon Coal Co. Ltd. C. |
| Con-Rycon Mine Au | 10 Hudson-Yukon Mine Ni Cu |
| 2 Echo Bay Mines Ag Cu | 11 Terra Mining & Expl. Ltd. Ag |
| 3 Canada Tungsten Mining C. Ltd. W. Cu | 12 Cadillac Mines Ltd. Ag Pb |
| 4 Pine Point Mines Ltd. Pb Zn | 13 Venus Mines Ltd. Ag Au |
| 5 United Keno Hill Mines Ltd. | 14 Norex Resources Ltd. Ag |
| Pb Zn Ag Cd | 15 Federated Mining Corp. Ltd. Ag |
| 6 New Imperial Mines Ltd. Cu | |
| 7 Cassiar Asbestos Corp. Ltd. Asb | |
| 8 Anvil Mining Corp. Ltd. Pb Zn Ag | |



3 A floating dredge being used in dredging for gold near Dawson, Yukon Territory, in 1964. These floating dredges are no longer used in dredging for gold. (Photo by E. Bork).

4 Miners at Anderson Concession, Hunker, Yukon Territory, in the 1890's. (Photo courtesy of Public Archives of Canada).



West of the Carcross Road, Phelps Dodge Corporation of Canada performed geological and detailed soil geochemical studies on the WAT, SON, and RIV claims as a follow-up to 1970 soil reconnaissance.

In the Dawson Range, (62) Silver Standard Mines Limited recovered 3,800 feet of drill core by the end of the season from 7 holes in the Dark Creek area. The similar, nearby property of Dawson Range Joint Venture received 14,000 feet of drilling. During 1970 Archer, Cathro and Associates did reconnaissance geochemistry and prospecting on this historic Williams Creek property on claims BOY, MAN, MAC. Also in the Dark Creek area is United Keno Hill Explorations which did geochemistry and geophysics on its claims, and plan further work. Mitsubishi Metal Mining Company Limited did soil geochemistry but had negative results near the Williams Creek property on the TK claims. Taseko Mines Limited and La Ronge Mining Limited, did soil geochemistry on the TASLAR group and recommend a number of areas for trenching and mapping. Hudson's Bay Oil and Gas Company Limited acquired the BAY claims in the Williams Creek-Dark Creek area and did soil geochemistry and ground magnetics. An IP survey is recommended.

To the west in the Dawson Range, Starbird Mines Limited flew its STAR claims on Prospector Mountain with airborne magnetometer early in the year following a soil geochemistry investigation. Work is likely to continue. International Mine Services found copper and lead soil anomalies on its TAB group (jointly owned by Prado Explorations, Gui-Por Uranium Mines, Leon Nickel Mines and Indian Mountain Mines) and recommended more detailed geochemistry.

Near the head of the White River (67) in the St. Elias Range, Imperial Oil performed magnetometer, induced potential and geochemical surveys on the LEP claim group.

Its nearby RAY claims, staked in 1970, were examined and samples analysed. Kennco Explorations (Western) Limited did geology and silt geochemistry during the last two seasons on the WRANGELL claims near the Alaskan boundary. Likely areas are appearing in the south and southwest portion of the claim block.

Near South MacMillan River, (68) Phelps Dodge Corporation of Canada drilled, did reconnaissance geological mapping, acquired new ground and drilled on the CASCA project skarn, earlier known as part of the Atlas Exploration Hess Project.

Tungsten

International Minerals and Chemical Corporation did soil geochemistry, bulldozer trenching and chip samples on its DARK claims around Scheelite Dome (69). Results indicate that the tungsten is related to quartz veins and is not in economical concentrations. Similar work occurred to the north where Canex Aerial Exploration Limited (Placer Development Limited) did soil geochemistry for gold, silver and tungsten in Dublin Gulch on the PAN and ARPA claims and, in 1971, did bulldozer trenching and drilling.

In the south, near Rancheria, (56) Wolf Lake Joint Ventures discovered 4 tungsten geochemistry anomalies related to sulphide-and scheelite-bearing skarn on the H claim group. A few miles north, A.C. Ogilvy did geology and geochemistry on the newly staked WOLF claims with plans for further exploration. Cal Tor Syndicate drilled 6 holes in the Fox Lake area on the CAB claims.

Hudson Bay Exploration and Development Company drilled 1,500 feet on the Watson Lake OMO claims, a copper-tungsten prospect.

Asbestos

A. C. Ogilvy staked the SAM claims (56), did geology, and uncovered 6 asbestos showings in previously unmapped serpentinized peridotite between the Tintina and Teslin trenches.

Coal

In the St. Elias Mountains (69) Norman H. Ursel Associates Limited continued coal exploration in the Niamod-laoc Mountain area (Lic. No. 18) and commenced in the Burwash Creek-Amphitheater Mountain area (Lic. No. 19). The 1972 season should consist of trenching, topographic surveys, reconnaissance and stratigraphic geology and drilling.

Developed by Anvil Mining Corporation and the Yukon Territorial Government, the new town of Faro is second largest in the Yukon and 13 miles from the lead-zinc-silver mine.



Northern Economic Development Branch

The Branch is responsible for the management of all northern resources and for advancing the economic development of northern Canada. Its tasks are to seek out and identify all possible ways and means of expanding the economy of the North at a more rapid pace; to develop a broad plan of economic progress and to recommend specific programs and policies for achieving these objectives.

The Branch also undertakes feasibility studies relating to northern development in order to create a suitable climate of opportunity for investment. Studies include such matters as transportation, smelters, townsite planning, power, etc. Financial assistance is provided for projects that are essential to the development of northern resources, one example being the construction of Great Slave Lake Railway which was undertaken to permit the development of Pine Point Mines.

The Branch is also responsible for establishing appropriate resource and economic development programs in line with the federal government's objectives. To meet these objectives the government has instituted many assistance programs to help the mineral industry overcome some of the high costs of operating in the North. These include the Northern Mineral Exploration Assistance Program, Prospectors' Assistance Program, Road and Airstrip Assistance Programs and Assay Services. In addition, financial support is given to organizations which assist in northern mineral development, such as Chambers of Mines and Accident Prevention Associations.

In order to discharge its functions, the Branch is subdivided into five groups: Oil and Mineral Division; Water, Forests and Land Division; Economic Staff Group, Northern Science Research Division and Northern Co-ordination Division.

This publication details mining activity north of 60 and, since the management of mining lands in this region rests with the Oil and Mineral Division, the responsibilities of that Division and its mining section are described in more detail on the following pages.

The Oil and Mineral Division is responsible for:

- a) the management and administration of Crown mineral rights in the Yukon Territory and Northwest Territories, including offshore areas lying north of the line described in the schedule to Order in Council P.C. 1965-2284;
- b) the formulation and recommendation of policies designed to encourage resource exploration and development, including the terms of disposal of mineral rights;
- c) the planning and assessment of programs designed to provide an adequate infrastructure so that the natural

resources, when found, can be profitably developed and delivered to market;

d) the evaluation of natural resource exploration and development projects to determine whether they qualify for any of the assistance programs available and /or government support in other areas;

e) the assessment of national fiscal policies and subsidy programs as they affect northern natural resources;

f) the administration of industrial safety legislations; and
g) representing the Department in discussions with the industries concerned and with other departments in the resource field.

Officers responsible for the administration of the above program of work are listed in the table following.

Department of Indian and Northern Affairs

Minister: Jean Chrétien, Ottawa, Ontario

Deputy Minister: H. B. Robinson, Ottawa, Ontario

Assistant Deputy Minister: A. D. Hunt, Ottawa, Ontario

Northern Economic Development Branch

Director: A. B. Yates, Ottawa, Ontario

Regional Director (Y.T.): B. J. Trevor, Whitehorse, Y.T.

Regional Director (NWT): G. B. Armstrong, Yellowknife, NWT

Oil and Mineral Division

Chief: H. W. Woodward, Ottawa, Ontario

Mining Section

Administrator of Mining: — Ottawa, Ontario

Mining Lands Unit

Head, Mining Lands Unit: R. J. Simard, Ottawa, Ontario

Supervising Mining Recorder: B. R. Baxter, Whitehorse, Y.T.

Mining Recorders: F. V. Daly, Ottawa, Ontario

O. C. Paton, Dawson, Yukon Territory

R. G. Ronaghan, Mayo, Yukon Territory

B. C. Thompson, Watson Lake, Yukon Territory

R. L. Williams, Yellowknife, Northwest Territories

Engineering and Inspection Services Unit

Chief Mining Engineer: S. Homulos, Ottawa, Ontario

Resident Mining Engineers: G. Needham, Whitehorse, Y.T.
M. L. Brown, Yellowknife, N.W.T.

District Mining Engineer: T. G. Csizmazia, Whitehorse, Y.T.
E. Bengts, Yellowknife, N.W.T.

Mine Rescue Superintendents: N. Boss, Yellowknife, N.W.T.
J. D. Barraclough, Whitehorse, Y.T.

Evaluation and Geological Services Unit

Head: A. D. Oliver, Ottawa, Ontario

Resident Geologists: D. B. Craig, M. Milner, Whitehorse, Y.T.

R. W. Hornal, P. J. Laporte, W. A. Padgham, Yellowknife, N.W.T.

Development and Incentive Program Section

Head: E. G. Puddington, Ottawa, Ontario

Assistant Head: J. R. Cote, Ottawa, Ontario

Mining Section

This section is responsible for the administration of mining and mineral rights (excluding oil and gas) from the acquisition of claims through to the production stage, including safety in mines. The section is comprised of three units — Mining Lands, Evaluation and Geological Services and Engineering and Inspection Services. The responsibilities for their operation rest with the Administrator of Mining.

Mining Lands Unit

For administrative purposes the Territories have been divided into seven mining districts, each of which has been allocated a Mining Recorder and supporting staff. The Mining Recorders are responsible for the disposition of the mineral rights within their respective districts in accordance with the legislation applicable. For each Territory there is a Supervising Mining Recorder whose principal function is to ensure that uniform practices are observed in the administration of the various mining acts and regulations. When necessary, the Supervising Mining Recorder interprets such acts and regulations and prepares directives and instructions.

Considerable progress has been made during the past year in the implementation of the computer program for Mining Claim Records. Due to the fact that the office for the Arctic and Hudson Bay Mining District is located in Ottawa, that office was selected as the first to go "computer" due to the close proximity of the technical personnel responsible for computer systems. All the goals originally envisaged have been reached and the results were satisfactory. Accordingly, it is planned to implement the system at Yellowknife (Office of the Mining Recorder for the Mackenzie Mining District) in 1972. It is expected that by 1973 all recording offices for the Yukon Territory and Northwest Territories will be completely computerized.

In conjunction with the computerization system a microfilm program also has been developed. The Arctic and Hudson Bay Mining District will be the first to adopt this system and it is quite certain that early in 1972 all records for this district will be photographed, with Yellowknife

following very closely. By mid-1973 the records in both territories will be completely filmed. Of the many advantages, the saving in office space is most impressive.

The districts and locations of Mining Recorders' offices are as follows:

	District	Office
<i>Yukon Territory</i>	Mayo	Mayo, Y.T.
	Dawson	Dawson, Y.T.
	Watson Lake	Watson Lake, Y.T.
	Whitehorse	Whitehorse, Y.T.
<i>Northwest Territories</i>	Mackenzie	Yellowknife, N.W.T.
	Nahanni	Watson Lake, Y.T.
	Arctic and Hudson Bay	Ottawa, Ontario

Mineral claims staked and recorded in the Yukon Territory and Northwest Territories during 1971, with comparative figures for 1970, are tabulated below:

Yukon Territory

District	Claims Recorded	
	1970	1971
Whitehorse	8,609	4,300
Dawson	848	1,000
Mayo	768	1,000
Watson Lake	1,294	1,200
Total	11,519	7,500

Northwest Territories

District	Claims Recorded	
	1970	1971
Mackenzie	8,852	5,100
Arctic and Hudson Bay	5,213	1,300
Nahanni	509	1,000
Total	14,574	6,700

Engineering and Inspection Services Unit

Headed by the Chief Mining Engineer for the Yukon and Northwest Territories stationed at Ottawa, this unit is responsible for all inspections, including safety inspections, of mines and mills, claims, assessment work on claims and other industrial operations north of the 60th parallel. It is also responsible for the preparation of new safety legislation, mine rescue and first aid training, operation of assay services and all other technical matters pertaining to mining.

Resident Mining Engineers are located at Whitehorse, Yukon Territory, and at Yellowknife, in the Northwest Territories.

During 1970 a complete revision of mining Safety Rules was completed, including new open pit rules for both Territories. These were adopted in 1971.

The fifth Canadian Mine Rescue Competition was held at Edmonton on June 19, 1971, with teams from British Columbia, Alberta, Saskatchewan, Nova Scotia, the Yukon Territory and the Northwest Territories competing. The mine Rescue Team from the Canmore Coal Mine in Alberta took first place and the Giant Yellowknife team from the Northwest Territories won the trophy for metalliferous mines donated by the United Steel Workers Union.

Mine Rescue

An additional 5 Draeger Units were added in the Northwest Territories during 1971. The present disposition of Draeger Equipment is as follows:

Yukon

Mine Rescue	12
United Keno Hill Mines Ltd.	12
Tantalus Coal Company	6
Hudson Yukon Mine	6

Northwest Territories

Central Station	30
Echo Bay Mines	6

Mining Safety Statistics—Yukon and Northwest Territories

The American Standard method of recording work injuries is used throughout and, in the case of accidents resulting in death, permanent total disability and permanent partial disability, the number of days recorded as lost time as a result of these accidents conforms with the scheduled time charges set down in the above noted Standard.

Disabling injuries are defined as those which result in death, permanent total disability, permanent partial disability or temporary total disability.

Days recorded as lost time are calendar days lost, but do not include the day of the accident or the day of return to work.

Accident frequency is expressed as the number of accidents per 1,000,000 man-hours worked.

Accident severity is expressed as the number of days lost, as a result of accidents, per 1,000,000 man-hours worked.

Accident Statistics—1971

To the end of December 1971, there were 110 disabling injuries reported in the Yukon. The accident frequency for disabling injuries decreased from 47 in 1970 to 39 in 1971. Accident severity decreased from 3,163 in 1970 to 1,208 in 1971. "Fall of persons" was the chief cause of accidents in Yukon, accounting for 26 per cent of all accidents, followed by "Strain while lifting" and "Caught between two objects". These three main causes accounted for 60 per cent of all accidents reported. No fatal mining accidents occurred in the Yukon Territory in 1971.

In the Northwest Territories 68 disabling injuries were reported. Accident frequency decreased from 26 in 1970 to 22 in 1971, while the severity decreased from 8,580 in 1970 to 6,670 in 1971. In the Northwest Territories, "Fall of persons" and "Caught between two objects" were the chief causes of accidents, accounting for 44 per cent of all accidents reported.

Three fatal accidents occurred in the Northwest Territories in 1971. A battery locomotive operator was killed instantly on July 14, 1971 at Echo Bay Mines when he was crushed between a chute and the battery locomotive he was operating. On July 30, 1971 a fuel truck driver at the Pine Point mine died after colliding into the rear end of a Euclid-trailer. On March 31, 1971 a surface labourer died when a fork-lift toppled on him at the Terra mine.

Exploration and Geological Services Unit

This unit provides a geological information and advisory service to those engaged in the mineral industry in the Yukon and Northwest Territories. Resident Geologists' offices are maintained in Whitehorse, Yukon, and Yellowknife, Northwest Territories. Geological Survey of Canada publications, such as geological, geophysical and topographical maps, memoirs, papers and reports, are available for sale to the public. A library of released technical assessment reports is available for reading and copying by means of a microfilm system. A small library of technical books and mining publications is also maintained for public convenience.

The Resident and District Geologists carry out mineral property examinations, collect rocks and mineral specimens and advise the mineral industry, government departments and research scientists on geological problems arising out of their work in the Territories. The service entails carrying out engineering and geological evaluations on mining developments in the Yukon and Northwest Territories and providing a consulting geological service for projects where government assistance is solicited, such as the Prospectors' Assistance Program, the Northern Mineral Exploration Assistance Program and the Northern Airstrip Assistance Program.

The Resident Geologists assist prospectors and geologists by identifying rock and mineral specimens, assisting in prospectors' training courses, preparing geological compilation maps on mineralized areas and giving direction when requested. Summer field surveys are carried out under the direction of the Resident Geologists as part of the mineral deposit inventory program.

The service is also responsible for evaluating all geological, geophysical, geochemical and other related work submitted in respect of representation work performed on mineral claims and on work commitments on prospecting permits.

Development and Incentive Program Section

This section initiates, implements and maintains policies and development programs and projects designed to stimulate the exploration for non-renewable resources in the Yukon and Northwest Territories.

The Government has developed a series of incentive programs designed to aid both companies and individuals in exploration and development activities in the North. These incentives can be broken down into three categories, namely: the provision of infrastructure, the provision of direct financial assistance and the provision of technical assistance.

Provision of Infrastructure Northern Roads Program

The Northern Roads Program, which was approved by the Federal Government in 1965, called for an annual expenditure of \$10 million for the following 10 years in both Territories. It is the first phase of a long-range, 20-year program designed to bring permanent roads to

within 200 miles of all potential areas of resource development. The policy was designed to be sufficiently flexible to allow revisions in priorities from year to year to keep pace with resource development. It also allowed for a shift in volume of construction from one Territory to another, depending on the requirements and based on northern territorial development.

Experience in administering the Northern Roads Program over the past six years has indicated the need to make certain changes to the policy. A revised policy document entitled "Northern Road Policy 1971" was approved on December 21, 1971.

One of the main features of the revised policy is the provision for the construction of Pioneer Roads. This new road category is designed to provide low cost access into undeveloped areas of favourable natural potential.

The new policy also provides for conservation measures which will further protect the northern land environment and minimize surface disturbance from transportation operations. It also includes provision for undertaking river crossing studies in light of future bridge constructions and for revision in road standards so that the type of road structure meets the needs of changing traffic patterns and designated load limits.

In order to achieve the objectives of the Northern Roads Policy, classification of roads were established wherein cost sharing formulas between Federal-Territorial-Private interests were defined. In this classification, there are two main categories of roads—(a) Communication and Network Roads and (b) Lateral Roads.

a) *Communication and Network Roads* are those highways and roads which provide a primary network of roads in the N.W.T. with connecting links to the Provinces. Their initial cost is borne completely by the Federal Government. Federal Government supplies 85% of maintenance costs, the Territorial Government 15%. Listed under this category are:

- Trunk Highways
- Secondary Trunk Roads
- Airport Roads

Since 1965 when this multipurpose \$100 million, \$10 million-a-year program was commenced, 802 miles of new roads at a cost of \$56.340 million have been constructed. Currently, the principal target for the Program is the 521-mile Dempster Highway stretching from Dawson in the Yukon to Tuktoyaktuk on the Arctic Coast, in the Northwest Territories.

b) *Lateral Roads* are those roads which lead from a communication and network road to a location where resource exploration, development and exploitation is being carried out or may in the near future be carried out.

Lateral Roads are further broken down into two sub-categories, Cost Sharing and Non Cost Sharing.

Cost Sharing Roads, as the name implies, are those roads which are constructed by a resource developer but are financed jointly by the developer and the Government. Included in this sub-category are Tote Trails, Initial Access Roads and Permanent Access Roads.

Tote Trails are constructed by a resource developer and may receive a grant of up to 50% of their cost of construction to a maximum contribution of \$20,000. These provide seasonal or year round access to the property of a company engaged in exploring or developing a natural resource. The Tote Trail Program is administered by the Commissioner of each Territory.

Initial Access Roads may receive the same maximum assistance grant as tote trails, but the maximum federal contribution will not exceed \$100,000 for projects of an exploratory nature or \$500,000 for projects in the development stage. This classification provided for contributions towards more costly roads than those provided for under tote trails.

Permanent Access Roads lead from the nearest permanent road to the location of a resource development that has been brought into full production stage. These roads may receive a federal contribution of up to 2/3 of their cost, but the maximum contribution may not exceed \$40,000 per mile.

Financial assistance in the amount of \$609,986 for access-road construction to date, of which \$114,670 was disbursed in 1971, was recommended for the following companies:

Cadillac Explorations Limited
Western Minerals Limited
Acorn Timber Limited
Anvil Mining Corporation Limited
Hudson Bay Mining and Smelting Co. Ltd.
Venus Mines Limited
Ace R. Parker and Associates
Mount Nansen

Northern Resource Airports Program

The original program approval was on T.B. Minute No. 647905, dated November 22, 1965. It is a cost-sharing scheme for constructing small airports to provide access to mineral and non-renewable resources, exploration and development sites, tourist development sites and to improve transportation facilities. They also serve as incentives to economic and social development.

Nature of Assistance

The policy refers to construction of airports in two categories. Under the first, Government assistance is available to defray 50% of the cost of an exploratory airport up to a maximum federal expenditure of \$20,000. For the second category, airstrips or airports built in connection with the pre-production or early production stage of natural resources exploitation, the Federal Government may contribute 50% of the cost up to a maximum of \$100,000 per airport.

Financial assistance in the amount of \$140,699 for airstrip construction assistance to date, of which \$44,099 was disbursed in 1971, was recommended for the following companies:

Bathurst Inlet Developments Limited
Triad Oil Co. Ltd. (B.P. Oil & Gas Ltd.)
International Mine Services Ltd.
Atlas Explorations Ltd.
Western Minerals Ltd.
Panarctic Oils Limited
Arctic Outpost Camps
B.C. Oil & Gas

A total of \$591,916 was committed to these projects in accordance with the provisions of the Road and Airstrips Assistance Program whereby the Federal Government will share the costs of approved construction.

Remote Airports Program

This program is people rather than resource oriented. The program is designed to provide small isolated communities, not warranting normal airports for scheduled airline services, with gravel all-weather airstrips, 3,300 feet in length capable of meeting the essential educational, health and emergency requirements of the community.

The program calls initially for the construction of 11 airports over an 8 to 10-year period at an estimated cost of \$6,167,000. The program calls for the Department to set the priorities for airport construction but the actual work will be done under Ministry of Transport supervision, with a view to adhering to standards that may permit ultimate airport licensing.

Since the inception of this Program in 1969, five airports have been constructed, or are under construction at the following communities: Coppermine, Whale Cove, Cape Dorset and Pangnirtung in the N.W.T. and Old Crow in the Y.T.

Provision for Direct Financial Assistance
Northern Mineral Exploration Assistance Program

This program is designed to encourage mineral exploration activity in the Yukon Territory and Northwest Territories. Assistance in respect of one or more exploratory programs for a single applicant is limited in aggregate to \$50,000 but not exceeding 40 per cent of the approved cost of an exploration program. A total of 176 corporate applicants have applied for assistance in one or more programs of exploratory work.

Since the inception of the Program in 1967, 132 applications have been approved and a total of \$3,356,086.16 has been paid in grants, leaving an outstanding commitment of \$629,203.42. Moreover, payments of \$9,022,500 have been made towards a large portion of oil and gas exploration in the Arctic Islands.

Prospectors' Assistance Program

In both the Yukon Territory and Northwest Territories, a combined amount of \$60,000 is available in the form of grants to aid prospectors in their search of mineral deposits. A prospector may receive up to \$900 each year to help finance his prospecting venture. The program has been well received since its introduction in 1962 and was instrumental in the location of several mineral discoveries.

During 1971, the entire amount was committed. Forty-one prospectors in the Northwest Territories and 62 in the Yukon Territory participated in the program.

Assay Service

There were approximately 669 assays performed during 1971 at the Government Assay office at Yellowknife at a value of \$2,369.00.

In the Yukon Territory, 50 per cent of the cost of 10 assays per prospector per year is paid by the Federal Government and during 1971, approximately 309 assays were paid for at a cost of \$2,396 to the Federal Government.

Causes of Disabling Injuries in Mines

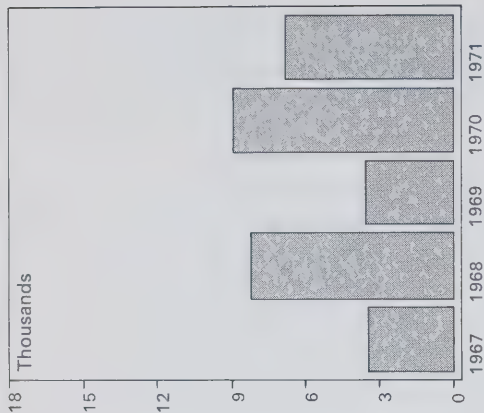
	Drilling	Caught between two objects	Strain while lifting	Fall of persons	Struck by moving object	Foreign matter in eyes	Tramming cars	Fall of rock	Falling object	Blasting	Gassing	Burns	Miscellaneous	Total
Northwest Territories														
Canada Tungsten Mining Corp. Ltd.		2		2	1				2				2	9
Con-Rycon-Vol-Yellorex		2	1	2			1	2					1	9
Echo Bay Mines Ltd.		6	6	8		1	1	3	2				2	29
Giant Yellowknife Mines Ltd.				1										1
Penarroya Canada Ltée.								1						1
Pine Point Mines Ltd.				1								1	2	4
Terra Mining and Exploration			1	6	2			1	1			1	3	15
Total		10	8	20	3	1	2	7	5			2	10	68

Yukon Territory														
Anvil Mining Corp.		2	8	7	3				1			1	3	25
Cassiar Asbestos Corp.		1		1										2
Hudson Yukon Mining Co. Ltd.		5	2	2	2	1		2			1	1	1	17
United Keno Hill Mines Ltd.		4	3	7	1				3					18
Venus Mines Ltd.		2		6	1		1	3						13
Tantalus Butte Coal Co.		1						2						3
Whitehorse Copper Mines Ltd.	1	3	6	2	5			2	1			2	5	27
Whitehorse Copper Mines Ltd. (AMC Const.)			1	4										5
Total	1	18	20	29	12	1	1	9	5		1	4	9	110

Mining Accident Severities

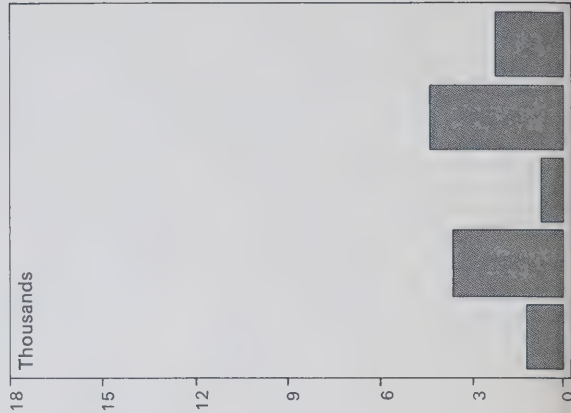
Northwest Territories

Mine	Number of Man-hours Worked 1971	Number of Days Lost Jan-Dec. 1971	Accident Severity Jan-Dec. 1971	Accident Severity Jan-Dec. 1970
Canada Tungsten Mining Corp. Ltd.	229,413	240	1,046	460
Con-Rycon-Vol-Yellorex	454,286	790	1,739	24,641
Echo Bay Mines Ltd.	279,575	6,271	22,430	340
Giant Yellowknife Mines Ltd.	794,083	22	27	1,781
Penarroya Canada Ltée.	6,400	12	1,875	95
Pine Point Mines Ltd.	1,041,452	6,108	5,864	5,411
Terra Mining Exploration Ltd.	168,007	6,389	38,028	44,068
Total	2,973,216	19,832	6,670	8,580



Yukon Territory

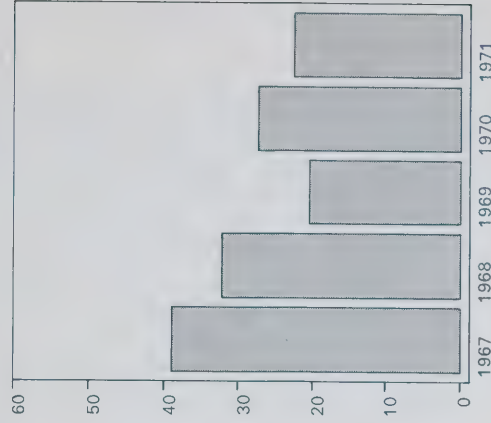
Mine	Number of Man-hours Worked 1971	Number of Days Lost Jan-Dec. 1971	Accident Severity Jan-Dec. 1971	Accident Severity Jan-Dec. 1970
Anvil Mining Corp.	845,019	230	272	7,877
Cassiar Asbestos Corp.	768,343	458	596	645
Hudson Bay Tom Claims				3,596
Hudson Yukon Mining Co. Ltd.	125,826	480	3,815	1,092
United Keno Hill Mines Ltd.	579,112	18	31	2,010
Venus Mines Ltd.	72,271	143	1,979	1,500
Tantalus Butte Coal Co.	24,016	48	1,999	5,625
Whitehorse Copper Mines Ltd.	301,033	769	2,555	681
Whitehorse Copper Mines Ltd. (AMC Const.)	47,586	126	2,648	



Mining Accident Frequencies

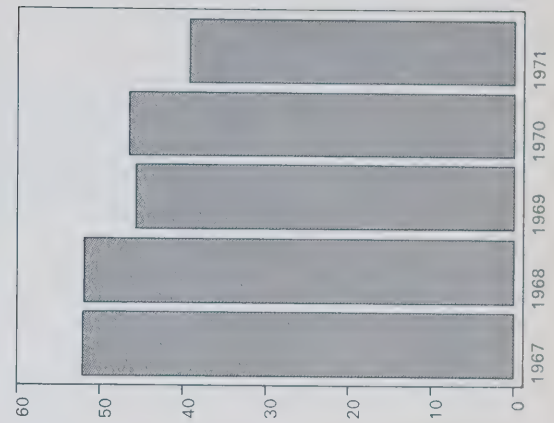
Northwest Territories

Mine	Number of Man-hours Worked 1971	Number of Accidents Jan-Dec. 1971	Accident Frequency Jan-Dec. 1971	Accident Frequency Jan-Dec. 1970
Canada Tungsten Mining Corp. Ltd.	229,413	9	39	38
Con-Rycon-Vol-Yellorex	454,286	9	19	18
Echo Bay Mines Ltd.	279,575	29	104	90
Giant Yellowknife Mines Ltd.	794,083	1	1	30
Penarroya Canada Ltée.	6,400	1	156	27
Pine Point Mines Ltd.	1,041,452	4	3	3
Terra Mining and Exploration Ltd.	168,007	15	89	118
Total	2,973,216	68	22	26



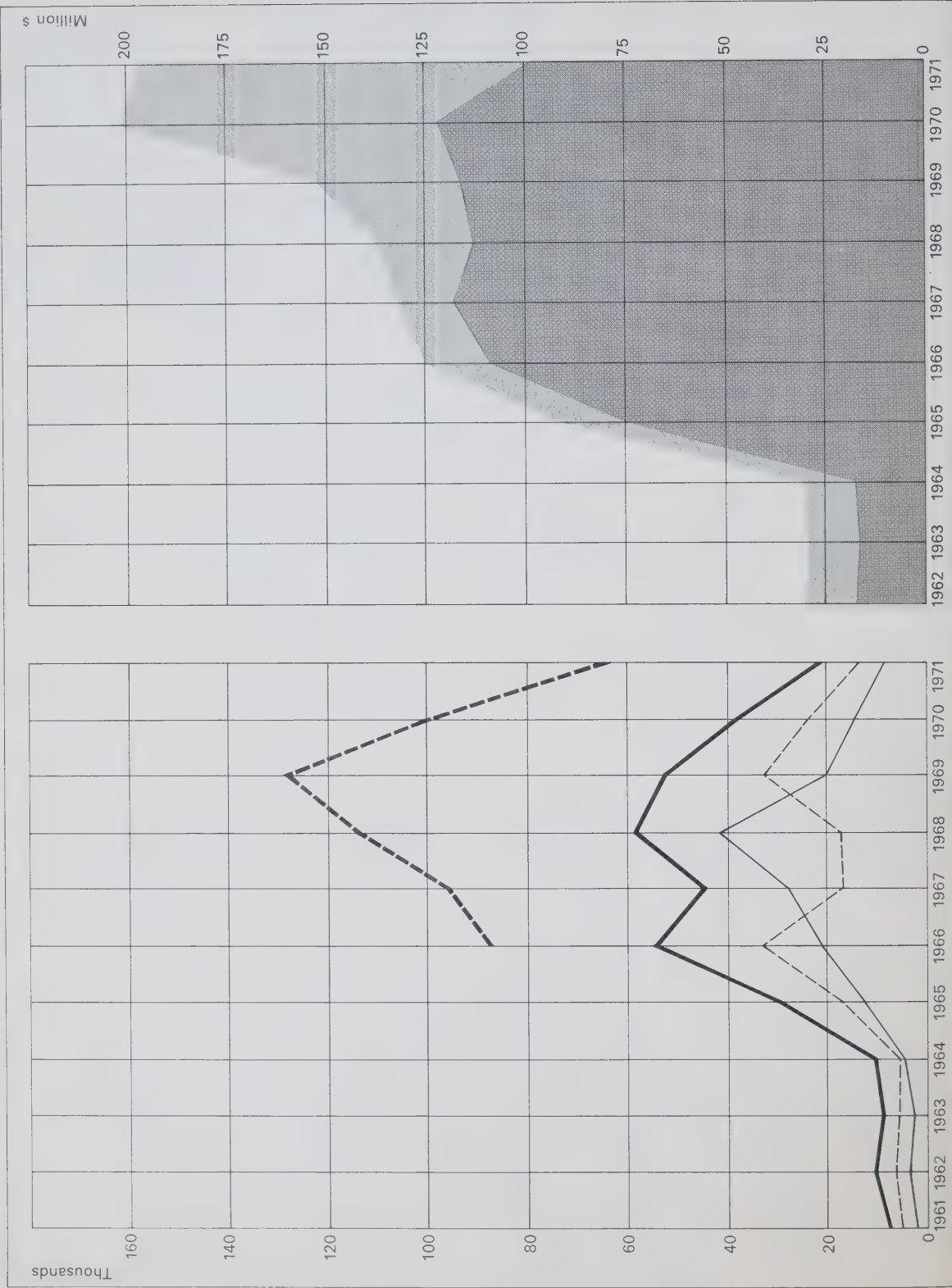
Yukon Territory

Mine	Number of Man-hours Worked 1971	Number of Accidents Jan-Dec. 1971	Accident Frequency Jan-Dec. 1971	Accident Frequency Jan-Dec. 1970
Anvil Mining Corp.	845,019	25	29	54
Cassiar Asbestos Corp.	768,343	2	3	23
Hudson Yukon Mining Co. Ltd.	125,826	17	135	76
United Keno Hill Mines Ltd.	579,112	18	31	33
Venus Mines Ltd.	72,271	13	179	212
Tantalus Butte Coal Co.	24,016	3	124	109
Whitehorse Copper Mines Ltd.	301,033	27	89	49
Whitehorse Copper Mines Ltd. (AMC Const.)	47,586	5	105	
Total	2,763,206	110	39	47



Mineral Claims Recorded

Value of Production



Mineral Production Chart 1962 to 1971

Northwest Territories										
Mineral	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971(a) Cumulative Totals(b)
Gold	\$ 14,974,924 ozs. 400,292	14,609,250 387,000	15,586,182 412,879	17,071,580 452,479	15,990,133 424,029	14,356,476 380,304	13,285,459 352,306	12,381,240 328,502	12,168,776 332,844	10,814,000 306,000
Silver	\$ 84,814 ozs. 72,802	107,216 77,468	91,312 65,223	1,490,754 1,064,824	2,325,407 1,662,192	3,429,755 1,980,228	8,677,365 3,751,563	3,910,888 2,026,367	5,114,587 2,764,642	2,669,000 1,711,000
Copper	\$ 194,928 lbs. 628,801	10,281 32,638	194,928 628,801	354,342 942,400	672,065 1,496,805	538,077 1,131,126	833,169 1,732,160	643,761 1,251,723	766,578 1,320,502	158,000 300,000
Nickel	\$ 1,503,837 lbs. 1,801,002									
Lead	\$ 823,279 lbs. 6,125,588	25,677,695 165,662,547	31,472,562 210,659,720	35,665,535 254,753,820	33,636,984 250,275,180	32,299,014 212,913,740	37,842,405 239,206,099	22,514,000 166,774,000		
Zinc	\$ 1,111,016 lbs. 7,840,620	28,596,474 189,380,626	57,128,344 378,333,400	60,852,900 419,964,800	57,504,129 407,830,700	68,275,481 448,296,000	76,004,563 477,115,900	61,950,000 370,292,000		
Pitchblende (d)	\$									79,477,897
Cadmium	\$ 516,635 lbs. 185,840	2,769,372 1,073,400	2,551,920 911,400	774,060 271,600	675,136 191,800	737,632 207,200				8,051,755
Bismuth	\$ 3,072 lbs. 490									
Total	\$ 16,758,503	14,726,747	17,611,789	73,707,480	110,357,883	117,394,663	114,711,166	118,185,520	132,637,613	98,132,000 1,068,825,708

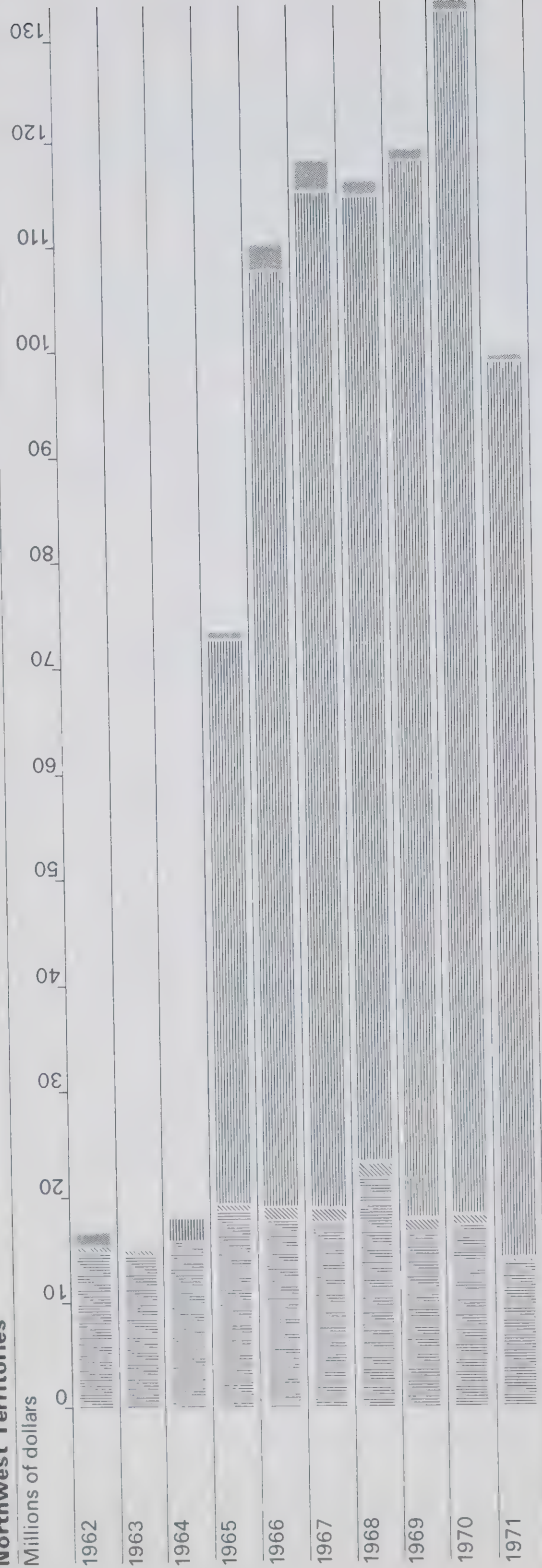
Yukon Territory										
Yukon Territory	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971(a) Cumulative Totals(b)
Gold	\$ 2,050,255 ozs. 54,805	2,084,215 55,211	2,183,611 57,844	1,698,975 45,031	1,639,103 43,466	675,725 17,900	911,338 24,167	1,118,715 29,682	653,034 17,862	601,000 17,000
Silver	\$ 7,551,814 ozs. 6,482,244	8,450,755 6,106,037	7,894,196 5,638,712	6,462,393 4,615,995	5,868,217 4,194,580	6,701,756 3,869,374	4,806,384 2,077,987	5,182,166 2,685,060	7,845,312 4,240,709	9,129,000 5,852,000
Lead	\$ 1,615,980 lbs. 16,290,125	1,867,647 16,978,607	2,744,235 20,418,415	2,766,953 17,851,309	2,386,684 15,975,125	2,141,959 15,299,709	970,629 7,221,940	4,256,183 28,056,581	20,830,196 131,670,010	29,185,000 216,184,000
Copper	\$ 132,990 lbs. 429,000					3,409,779 7,167,919	5,097,157 10,597,000	7,645,623 14,866,077	9,148,995 15,760,000	2,693,000 5,100,000
Coal	\$ 115,198 tons 7,649	123,675 8,231	98,150 7,229	85,626 8,801	46,390 5,670	15,791 1,912				
Zinc	\$ 1,438,554 lbs. 11,888,876	1,514,520 11,850,706	1,855,512 13,094,653	2,000,396 13,247,653	1,729,027 11,450,510	1,373,151 9,476,545	748,206 5,306,429	5,035,385 33,062,280	24,845,216 155,964,948	38,362,000 229,302,000
Cadmium	\$ 231,328 lbs. 134,493	326,124 135,885	428,399 132,222	386,192 138,918	306,336 118,735	265,997 94,999	147,716 51,830	239,965 68,172	261,528 73,463	161,000 83,000
Asbestos	\$					406,371 2,260	8,684,125 63,592	11,924,526 87,437	13,927,652 105,638	13,900,000 99,000
Total	\$ 13,136,119	14,366,936	15,204,103	13,400,535	11,975,757	14,990,529	21,365,555	35,402,563	77,511,933	94,031,000 725,648,748

(a) Preliminary Figures (b) Cumulative Totals—1932 to December 31, 1971 (Figures for tungsten not available)
(c) Cumulative Totals—1886 to December 31, 1971 (d) Figures for years 1932, 1943, to 1953 not available.

Value of Mining Production

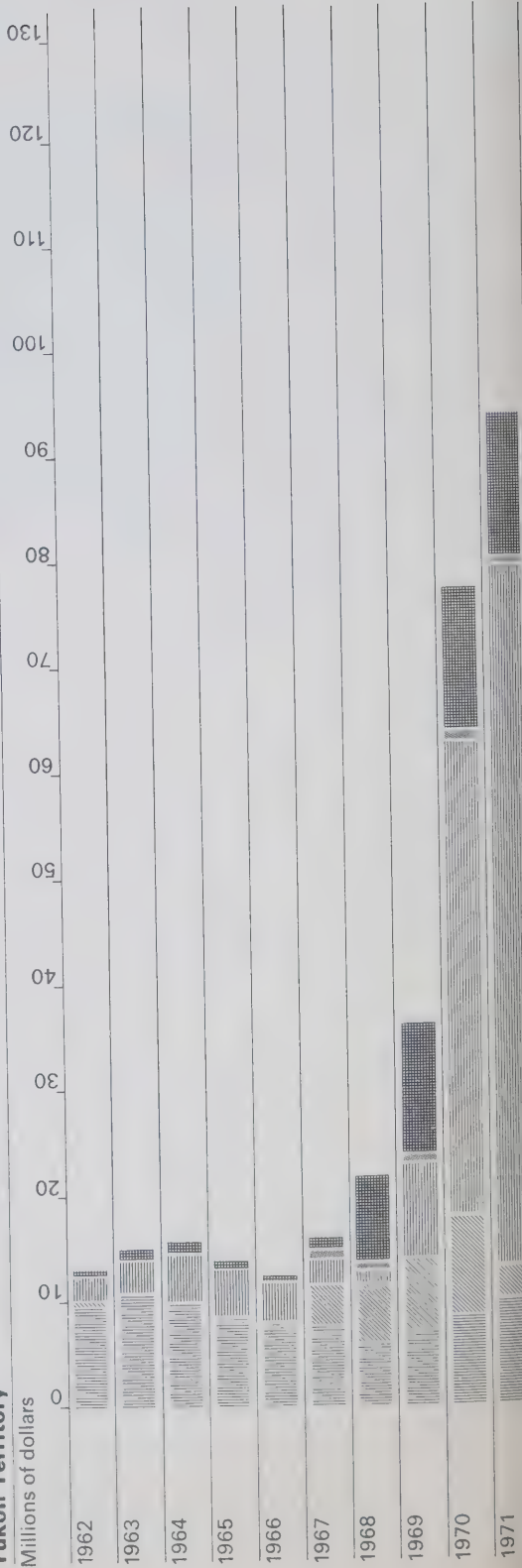
Northwest Territories

Millions of dollars

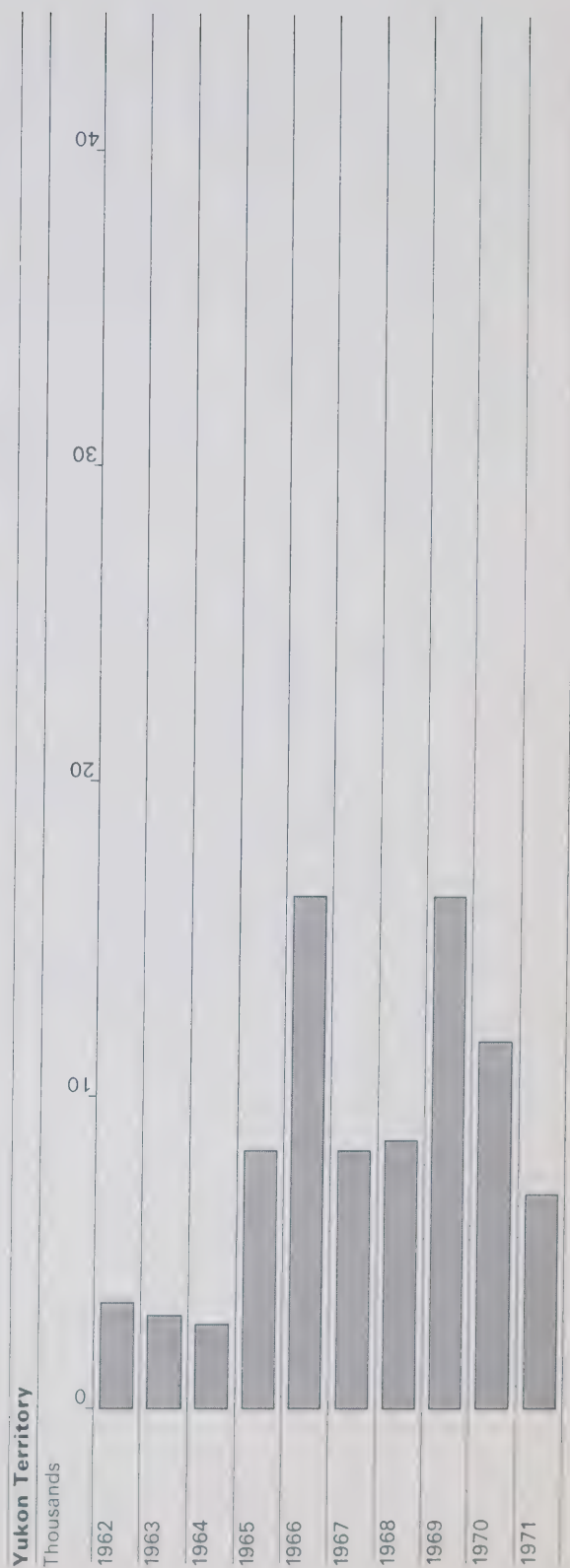


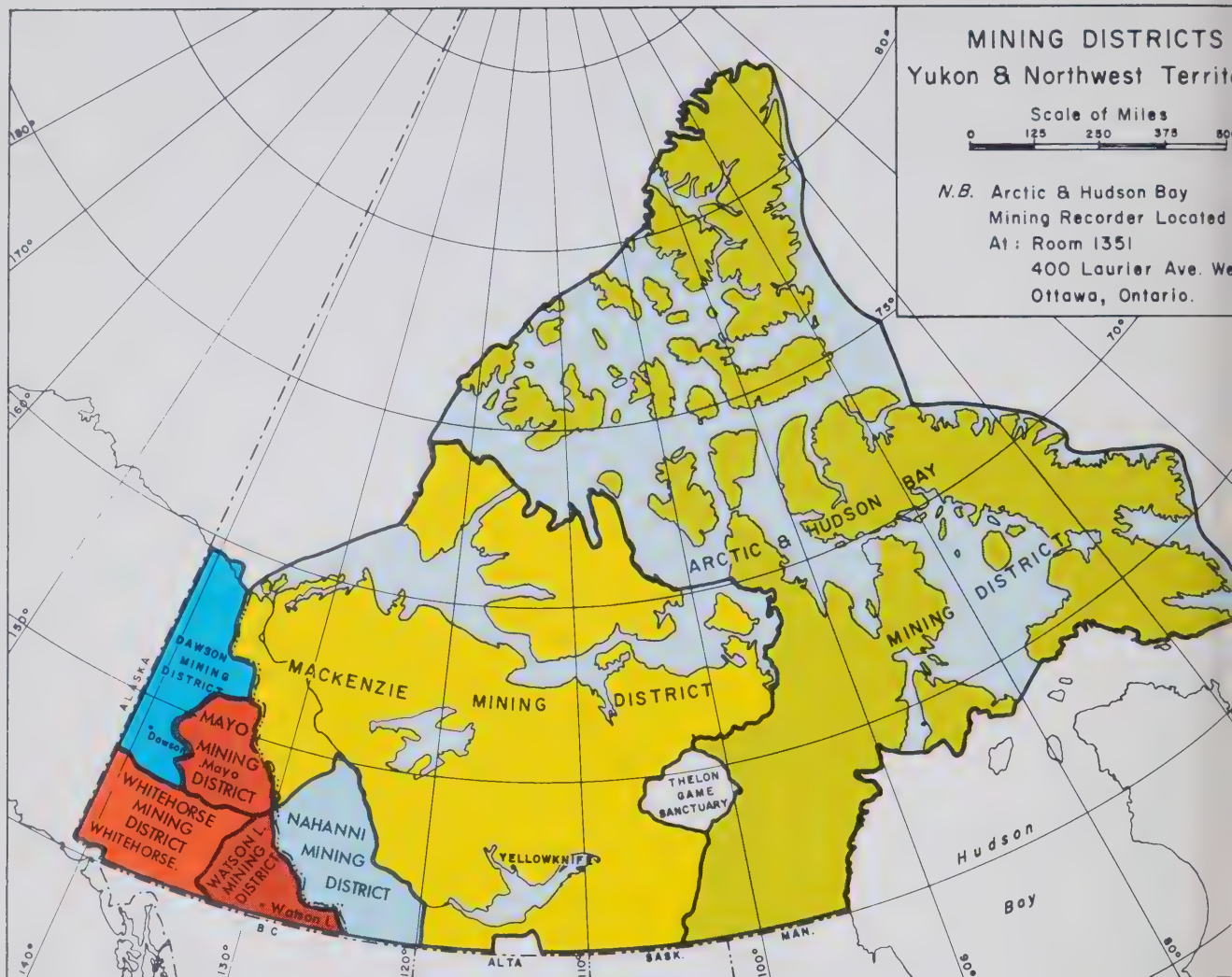
Yukon Territory

Millions of dollars



Mineral Claims Recorded







Indian and
Northern Affairs

Affaires indiennes
et du Nord

North of 60

Mines and Minerals
Activities 1972

91
261
135



11 a

Government
Political Science

North of 60

Mines and Minerals Activities 1972

Mining Section

Oil and Mineral Division

Northern Natural Resources and Environment Branch

Department of Indian Affairs and

Northern Development

Issued under the authority of the
Hon. Jean Chrétien, PC, MP, Minister of
Indian Affairs and Northern Development



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Introduction

Mining in Canada's North has reached an all-time peak in mineral production. In the Yukon, the value of production in 1972 was \$102,418,000, while in the Northwest Territories it was \$124,149,000. Reconnaissance activity was down in 1972, although property examination and development remained at a high level.

Highlights of the year were:

- 1) Whitehorse Copper Mines Ltd. resumed production of copper from a new underground mine in December, 1972
- 2) Canada Tungsten Mining Corporation Ltd. announced the discovery of a new tungsten mineral deposit near to its present open-pit mine.
- 3) Amax Exploration Ltd. announced it has outlined 30 million tons of 0.9% tungsten trioxide on its Mac Tung property, making this one of the largest known tungsten deposits in the free world.
- 4) Canex Placer Ltd. announced the discovery of lead-zinc mineralization near Summit Lake on the Yukon-Northwest Territories border.
- 5) Underground exploration and development was carried out on the Arvik Mines Ltd. lead-zinc property on Little Cornwallis Island. This is Canada's most northerly developing property.
- 6) A feasibility study is being made on the lead-zinc property optioned by Mineral Resources International Ltd. from Texas Gulf Inc. near Strathcona Sound, Baffin Island.

The Department of Indian Affairs and Northern Development continues to encourage exploration with various assistance programs, including Northern Mineral Exploration Assistance, Prospectors' Assistance and Roads and Airport Assistance. In addition, revisions are proposed of mineral legislation which applies to the Yukon and to the Northwest Territories in order to improve procedures for acquisition of mineral rights to bring them in line with modern exploration and development techniques.

The Department is maintaining its scientific services programs and has established diamond drill core storage libraries in both Territories. In co-operation with the Department of Energy, Mines and Resources, basic science studies will be undertaken in areas under active exploration.

Numbers in parenthesis throughout book refer to location of activity area on accompanying mineral exploration and mining map.

Wings for the Prospectors

Although Canada's interest in the High Arctic dates back to 1880, when the British Government granted the Arctic Islands to the Dominion, lack of efficient transportation proved a stumbling block to northern development for nearly half a century. During this period, the main forms of transport between "civilization" and the area north of 60 degrees were a government supply steamer's annual visit to the Eastern Arctic and slow barge traffic down the Mackenzie River each summer until the late 20's.

Then came the era of the bush pilots, who were instrumental in opening up the Northwest in terms of accelerated mining exploration and fur trading. They had little or nothing in the way of radio aids to navigation or weather forecasting, although some telecommunications services were used in the early stages of development.

It was on August 16, 1920, that the first aircraft ever to land in the Yukon flew into Whitehorse; these were three of the Alaska Air Expeditions' De Havilland 4B aircraft.

The first aircraft to land in the Northwest Territories were two Junkers JL-6s purchased by Imperial Oil Company for use at its new discovery well (now Norman Wells).

On March 27, 1921, these two ski-equipped aircraft were flown from Fort Vermillion, Alberta to Hay River, N.W.T., where they landed in deep snow. These two planes were the forerunners of hundreds of bush aircraft, which because of the multitude of lakes and rivers in the Territories were to be used for exploration and development for years to come.

In the summer of 1922 investigations were carried out on flying conditions and the establishment of landing sites on the northern tip of Baffin Island and on northern Devon and Ellesmere Islands.

Using flying boats and float-equipped aircraft, exploration companies explored and prospected in the country adjacent to the upper waters of the Liard and Yukon Rivers and in the Mackenzie River Basin during the summers of 1925 and 1926. The earliest flying companies whose aircraft penetrated North of 60 were Laurentide Air Services, Western Canada Airways, Canadian Airways, Yukon Airways and Exploration Company, Dominion Explorers, Northern Aerial Minerals Exploration, Prospectors Airways, Treadwell Yukon Company, and Consolidated Mining and Smelting Company of Canada (now Cominco).

Experience in those early years of aviation in the North had shown that float-equipped aircraft were slower and more costly to operate than wheeled aircraft. Wheeled aircraft could carry heavier loads and in most instances were more convenient for loading and unloading heavy bulky freight.

During World War II a number of airports were built across the North. These were linked with the development of the Distant Early Warning Line and other defence establishments. In the 1950's the Department of Transport began the gradual takeover of these air fields in order to make them available in support of increasing civilian air traffic to and from the Arctic regions. These included Whitehorse, Watson Lake, Coral Harbour, St. Aishihik, Frobisher Bay, Cambridge Bay and Resolute. Later, an airport was built at Inuvik, near the mouth of the Mackenzie River, and this town rapidly became an important distribution point for the far Northwest.

Aircraft have opened the North to a remarkable extent. Distance today must be measured in terms of the time it takes to get from one place to another and in these terms the North, in common with other parts of the globe, has shrunk.

Today there are at least seven airlines operating scheduled services between airports, using jet aircraft. Many more firms are licensed to operate chartered flights from major centres to northern resource development projects.

The helicopter is also playing a vital role in the North. It can reach places that are otherwise inaccessible.

Throughout this publication are illustrations of some of the types of aircraft which have been used to open up our northern frontier.



This Western Canada Airway's Fokker Super-Universal G-CASK, which had been in regular air mail service, was unbeached on August 4, 1930, at Cambridge Bay, Northwest Territories, after having been exposed to the arctic weather for nearly a full year. Ice, snow, sleet, rain, wind, blizzard and a blazing summer sunlight had assailed the plane. SK's sister, Fokker G-CASL, flew in with supplies

and it took just two hours and 34 minutes to fill SK's empty tanks with gas and oil. Then, with a perfectly operating motor and without other ground preparations, SK took off and flew faultlessly 1,000 miles south to her home airport at McMurray. The SK made the first flight across the Barrens in 1928.

Yellowknife, capital of the N.W.T., is a modern and thriving city accessible by air, land and water.



Northwest Territories

Producing Mines

Production was achieved from seven mines: two open-pit and five underground operations, producing lead, zinc, copper, gold, silver and tungsten. Lead-zinc accounted for 85% of the total value of production. The operating mines are:

Lead-Zinc

Pine Point Mines Ltd. increased its daily production from 10,545 tons per day in 1971 to 10,671 tons per day in 1972. Although production was from open-pit operations, underground exploration and development work was carried out in the M-40 ore body. Surface exploration was carried out on adjoining claims west of the present production pits and ore reserves were maintained. The average work force employed at the mine during the year was 524.

Pine Point Mines Ltd.

Location:	South shore of Great Slave Lake, 50 miles east of Hay River, N.W.T.
Product:	zinc and lead
Rate:	10,671 tons per day
Tons Milled:	3,809,729
Grade:	9.9 per cent combined lead-zinc
Reserves:	41.9 million tons
Employees:	524

Gold

Con-Rycon-Vol produced at a rate of 451 tons per day. Successful underground exploratory work and underground drilling resulted in the increase of ore reserves by 1,000,000 tons, which at the current rate of production adds 7 years to the life of the mine. Development work is being carried out at present to prepare the new ore for mining. The mine maintained a work force of 209 employees during the year.

Con-Rycon-Vol Mine

Location:	1.5 miles south of Yellowknife
Product:	gold
Rate:	451 tons per day
Tons Milled:	164,776
Grade:	0.576 ounces per ton
Reserves:	10 years at present rate of production
Employees:	209

Giant Yellowknife Mines Ltd. continued to mill at the rate of 1,100 tons per day, 800 tons of which came from the Giant Mine while the remainder came from the adjoining and interconnected Lolor and Supercrest mines. High prices for gold enabled this mine to maintain revenues, but new ore is not being found to maintain or increase reserves. With present ore reserves and the current rate of production, the life of the mine is estimated to be two years. Giant employs 380 men at its Yellowknife operation.

Giant Yellowknife Gold Mines Ltd.

Location:	1.5 miles north of Yellowknife
Product:	gold
Rate:	1,100 tons per day (including ore from adjoining Supercrest and Lolor properties)
*Tons Milled:	401,522
Grade:	0.50 ounces per ton
Reserves:	745,000 tons
Employees:	380
*Includes Supercrest and Lolor	

Silver-Copper

Echo Bay Mines Ltd., situated on Great Bear Lake, continued to operate throughout the year at a rate of 112 tons per day with a work force of 128 men.

Echo Bay Mines Ltd.

Location:	Great Bear Lake
Product:	silver-copper
Rate:	112 tons per day
Tons Milled:	37,290
Grade:	55 ounces silver per ton
Reserves:	2 years at present rate of production
Employees:	128

Silver-Copper Bismuth

Terra Mining and Exploration Ltd., located on Rainy Lake, 10 miles south of Great Bear Lake, continued to operate at a rate of 76 tons per day with a work force of 40 men. Silver-copper concentrates are shipped for refining.

Terra Mining and Exploration Co. Ltd.

Location:	10 miles south of Great Bear Lake
Product:	silver-bismuth-copper
Rate:	76 tons per day
Tons Milled:	22,727
Grade:	41.4 ounces of silver per ton and 0.8 per cent copper
Reserves:	not available
Employees:	40

Tungsten-Copper

Canada Tungsten Mining Corporation Ltd. continued production at a rate of 466 tons per day with a total work force of 84 men. Due to weather conditions, the open-pit is operated during the summer months and the ore is stock-piled for year-round milling. The company recently announced that exploration drilling has revealed a new mineral deposit adjacent to the open pit. Underground exploration and drilling are being carried out to determine the size and grade of the deposit.

Canada Tungsten Mining Corporation

Location:	125 miles north of Watson Lake, Y.T.
Product:	tungsten
Rate:	466 tons per day
Tons Milled:	172,828
Grade:	1.19 per cent WO_3
Reserves:	not available
Employees:	84

Silver

Federated Mining Corp. Ltd. mined and milled a small tonnage on its Camsell River property, 250 miles north of Yellowknife, in the spring of 1972.

Developing Properties

Iron

Baffinland Iron Mines Ltd. holds 306 mineral claims containing more than 130,000,000 tons of high grade iron ore (68% Fe) situated near Mary River on northern Baffin Island. A detailed and ongoing feasibility study is being conducted by the company to determine whether or not production can be achieved (78).

Lead-Zinc

Texas Gulf Inc. has a lead-zinc property situated on Strathcona Sound, northwest Baffin Island, which is the subject of a production feasibility study. Previous exploration indicated the presence of 12,000,000 tons of silver-lead-zinc mineralization. Mineral Resources International is sponsoring the study as part of an agreement with Texas Gulf Inc. Three surface diamond drills, working at the west end of the zone, carried out 10,000 feet of diamond drilling in the fall of 1972. A decision on production is expected by the middle of 1973 (1).

Mineral Exploration

Mineral exploration expenditures in the Northwest Territories were slightly lower in 1972 than in the previous year, but a number of new prospecting programs were begun. The revival in metal prices augurs well for a busy 1973.

Some 5,500 claims were recorded in 1972, and 17 new prospecting permits were issued. Areas within which considerable staking occurred included (1) the Strathcona Sound area on Baffin Island, the result of lapsed prospecting permits, (2) Bathurst and Cornwallis Islands, the result of *Cominco's* exploration around *Arvik Mines*, (3) the Pine Point area, the result of activity by *Conwest Exploration Co. Ltd.* and *Pine Point Mines Ltd.*, (4) the River area, where *Adera Mining Co. Ltd.* staked 500 claims east and south of the *Giant Yellowknife Mines* permits, and, (5) the Summit Lake area on the Yukon Northwest Territories border, the result of the Canex Placer Ltd. lead-zinc find.

Lead and Zinc

The search for lead and zinc deposits continued at a high level, spurred by the large size and high grade of recent discoveries, and by favourable market conditions. Several companies stepped up their programs in the sedimentary basins west and north of the Shield.

Arctic Islands

Cominco Ltd. (2) conducted an extensive exploration program consisting of prospecting, geological mapping, geophysics and geochemistry over the northern extensions of the Boothia Arch around *Arvik Mines'* lead-zinc development. The company holds 12 prospecting permits covering parts of Cornwallis Island, Little Cornwallis Island, the Grinnell Peninsula on Devon Island, and several smaller islands in this region.

Bow Valley Industries Ltd. conducted a prospecting program over Crozier and Baring Islands north of Cornwall Island.

Mackenzie, Franklin and Selwyn Mountains

In mid-November Canex Placer Ltd. (5) announced a significant lead-zinc discovery on the N.W.T.-Yukon border in lower Paleozoic argillites. A staking rush followed the announcement and 574 claims were located in the N.W.T. The company plans to return in 1973 to further evaluate its discovery.

In the Wrigley area *Cominco Ltd.* (6) conducted an extensive prospecting and exploration program on its prospecting permits acquired following a lead-zinc discovery in this area during 1971. The showing was trenched, drilled and surveyed by IP.

The dominant ore mineral is a low-iron, red to dark brown sphalerite disseminated through limestone. Minor galena is present. Pyrite is present only in small amounts in one or two pits but iron oxides are locally abundant. A small content of silver is reported.

The mineralization is found mainly in the Headless Formation, a unit of flaggy greyish, argillaceous limestone containing abundant bitumen. This unit ranges around 200 feet in thickness. In places the ore minerals appear to be in distinct beds, but elsewhere they appear to lie along fault zones. Beneath the Headless lie many feet of partly dolomitized Manetoe Formation. A narrow galena quartz vein has been found in this formation some one-half mile or so south of the main showings.

Newmont Mining Corp. of Canada Ltd. (7) conducted an IP survey in April over the JET claims on Old Fort Island, the location of a galena showing in calcite veins in limestone (62° 59'N, 123° 14'W). In August at least three drill holes were put down to test the continuity of these veins and the possibility of a fault structure south of the island. No significant mineralization was found. A crew also spent the summer prospecting on the east side of the Mackenzie River from Wrigley to the Great Bear River.

Cordilleran Engineering Co. Ltd. (8) of Vancouver conducted a helicopter supported prospecting program for lead and zinc in lower Paleozoic carbonates in the Mackenzie Mountains for *Barrier Reef Resources Ltd.*, *Conwest Exploration Co. Ltd.*, *Western Minerals Ltd.* and *Asele Industries Limited*. The crew collected stream sediment samples, lake water samples and lake sediment samples. No claims were staked.

Dome Mines Ltd. and *Jorex Ltd.* (9) contracted J. R. Woodcock to prospect dolomite facies fronts in the vicinity of Cadillac's property for lead-zinc mineralization. Showings were disappointing.

Texas Gulf Inc. (9) prospected on its permit area (95 F/8). Some stratigraphic sections were measured and sphalerite was noted in place and in float within the permit boundaries.

Pine Point Area (10)

Pine Point Mines Ltd. continued actively exploring both east and west of its known ore bodies. The program consisted of drilling, gravity and IP surveys and restaking of favourable ground.

Conwest Exploration Co. Ltd. acquired by staking and option more than 200 claims bordering the Pine Point property to the north. It conducted an IP survey over portions of the ground in the spring.

Quantus Exploration Ltd., owners of the AQ claim block on the shore of Great Slave Lake, is believed to have conducted an airborne EM and magnetometer survey over this claim block.

Hackett River Area (11)

Cominco Ltd., in the early spring, optioned the SA and ED claim groups for *Mid North Exploration Ltd.* These claim groups lie some 11 miles southeast of the "A" ore zone on *Bathurst Norsemines'* property and contain two showings of galena in clean quartzites. The work this summer consisted of ground EM, magnetometer and gravity surveys, geological mapping and some shallow drilling to test the showings and the best EM anomalies. *Cominco* also resurveyed its Cleaver Lake Zone with ground EM, magnetometer and gravimeter surveys. The anomaly was found to trend northerly rather than easterly and two holes were drilled to test the new trend. Both holes intersected over 150 feet of excellent mineralization.

Tri-Con Surveys Ltd., for *Ice Station Resources Ltd.*, conducted ground geophysical surveys and geological mapping on a belt of metavolcanics covered by the HAC group of claims some 10 miles north of *Bathurst Norsemines'* "A" ore zone. As a result of these surveys, some 3,000 feet of diamond drilling was performed on selected conductors.

Copper

Exploration for copper and associated base metals continued to be widespread throughout the Northwest Territories.

Keewatin District

Husky Oil Ltd. (12) flew a three-man crew from Geotrex into the Last Lake area for a 10-day contract involving EM and magnetometer ground follow-up on 10 anomalies. The party was supported by a helicopter and was joined by a consulting geologist who mapped the anomalous areas. Four of the anomalies are covered by overburden in an area underlain by pillowed andesites and diorites. Some graphite-bearing float was located in the



area. Another anomaly occurs within a shear zone in volcanics. The shear parallels a volcanic-quartzite contact and is essentially barren. A sixth anomaly also occurs in a shear zone at the contact between pillowed andesites and diorites. The shear zone has been broken by a number of minor faults and encloses a pyrite-pyrrhotite zone.

Five Star Petroleum and Mines Ltd. (13) conducted two drilling programs, one in the spring and one in September, on its MAR claims in the Pistol Bay area. The targets for drilling were selected from airborne geophysical surveys conducted in 1971. Several conductive bodies have been located in a three-mile long, 200-foot wide fault structure.

Rankin Nickel Syndicate (14) commissioned Geoterrex Ltd. to do IP and EM surveys in July and August over 10 anomalies identified by previous work in the Rankin Inlet area. The IP results were generally unsatisfactory because of soil conditions. As a result of the EM work some 10 holes were drilled.

Canadian Superior Exploration Ltd. (15) put an 11-man party, made up of two geological mapping crews, two geophysical surveying crews, one helicopter crew and one cook, to work in its permit areas near Carr Lake that had been covered last year by an airborne geophysical survey. Investigation of some 20 to 30 geophysical anomalies indicated the majority occur within Archean sediments. Detailed geological mapping covered an eight-mile long by six-mile wide area trending southwest from the southwest shore of Carr Lake across Spi Lake to the esker in the southwest corner of quadrant 55 L/4. The geological sequence in the area consists of sediments in the northwest, overlain by andesitic to felsic volcanics in the southeast.

Freeport Canadian Exploration Co. Ltd. conducted an EM survey over the DEE claim group in the same area (62° 03'N, 95° 52'W). The company indicated that a drill program may be done from the ice of Spi Lake during the winter of 1972-73. This group was optioned from *Giant Yellowknife Mines Ltd.*

A private prospecting syndicate prospected the area to the northeast of Munro Lake (16), which is underlain by felsic volcanics and is cut by three major faults, one trending east-northeast along the sediment-felsic volcanic contact and two trending northwest. The area is drift

covered but two mineralized zones of frost-heaved boulders were discovered trending east to east-northeast. One zone consists of disseminated pyrite and minor chalcopyrite in felsic volcanics; the second consists of disseminated pyrrhotite and minor chalcopyrite in felsic volcanics. Fifty claims were staked to cover the area of interest. An assay of a grab sample from one of the showings gave 5.50% copper, 1.83% zinc and 3.5 ounces of silver per ton, with minor gold and lead values. The property has been optioned by *Selco Exploration Co. Ltd.*

Conwest Exploration Co. Ltd. sent a three-man geological crew into the area between Quartzite Lake and Tavani (17) to examine rhyolites identified by the G.S.C.

Umex also sent a geologist to reconnoitre the Rankin Inlet-Ennadai Lake volcanic belt.

A crew from *Aquitaine Co. of Canada Ltd.* spent three weeks prospecting and trenching on a permit issued in 1972 in the Quoich River area (18). The main zone of interest was pyrite-pyrrhotite bands in undifferentiated Hurwitz Group metasediments. The bands, mainly pyrite with pyrrhotite lenses, occur in impure quartzite and quartz-rich schistose sediments, enclosed in gneisses. The geological setting is similar to that of the IP anomaly drilled in 1971 on the Ketyet River claims.

Aquitaine also prospected gossan zones in the Curtis Lake-Stewart Lake area (19) and its permits and claim groups southwest of Committee Bay (20). Geophysical, geological and geochemical studies were done. The company also briefly examined the Chantrey Group metasediments from Chantrey Inlet to the Murchison River (21).

Great Slave Lake Area

Colby Mines Ltd. drilled 2,000 feet on the BBX claims, a copper showing at Taltheilei Narrows (22). Although holes directed under the main trench intersected some chalcopyrite, no significant intersections were made.

Giant Yellowknife Mines Ltd. drilled the G Group, a copper showing in dolomite of the Utsingi Formation in the Pethei Peninsula (23).

Trigg Woollett and Associates continued a study of the metallogenesis of the East Arm for *Imperial Oil Ltd.* In addition to geological mapping, some showings were trenched and samples for geochemistry were taken from others.

The *Greenstone Syndicate* trenched a chalcopyrite bearing zone on the TO claims on the north shore of Hearne Channel (24).

A number of trenches were blasted to establish widths and grades on chalcopyrite mineralization in east-north-easterly trending veins on the BEV 24 mineral claim south of the East Arm (25). This work was done by *Nor-Can Minerals Ltd.*

Shield Resources Ltd. in partnership with *Vestor Explorations Ltd.* and *Precambrian Mining Services Ltd.* drilled one hole to test an EM conductor noted in 1971 on the OSW claim group near Indian Mountain Lake (26). The hole intersected nodular quartz mica schists, fragmented rhyolite flows and tuffs, and a three-foot length of massive pyrrhotite with minor pyrite, sphalerite and chalcopyrite. The property was abandoned.

Indian Mountain Metal Mines Ltd. acquired the VOO claims bordering their BB and BBX claims to the west of Kennedy Lake (26). The copper zone intersected in the previous drilling under Kennedy Lake apparently outcrops on these claims on the western shore. Two trenches were excavated 1,000 feet apart and revealed chalcopyrite mineralization over widths of up to 20 feet. The chalcopyrite occurs in zones of siliceous hornblende garnet schist. In September a ground EM survey was run over the area between the claims.

Beaulieu River Area (27)

Geophysical Engineering and Surveys Ltd. drilled four holes totalling 306 feet on airborne Dighem anomalies on the NOT claim group. Minor stringers of chalcopyrite with sphalerite were noted in pyrrhotite and graphite lenses in acid volcanics and sediments.

The above company also drilled five holes totalling 505 feet on Dighem anomalies in the OAR and RAT claim groups, three to eight miles east of Horner Lake.

Shield Resources Ltd., *Numac Oil and Gas Co. Ltd.* and *Getty Mines Ltd.* drilled four new holes on their KK claims in the spring of the year on soil geochemical anomalies noted in 1971.

A crew from *Great Plains Development Co. of Canada Ltd.* spent three weeks prospecting the Cameron River greenstone belt. In 1971 this company conducted an airborne EM and magnetometer survey in this area.

Yellowknife to Great Bear Lake

Freeport Canadian Exploration Co. drilled six holes totalling 2400 feet in the Indin Lake area (28). Rocks intersected include garnet-biotite schist (meta-greywacke), fragmental volcanics and white, almost structureless, metarhyolite. Mineralization occurs in graphitic zones.

Great Plains Development Co. of Canada Ltd. completed an extensive program of geophysics, geological mapping, trenching and Winkie drilling on its claim groups on the south shore of Wijinnedi Lake (29) and north along the Snare River to Indin Lake.

Shield Resources Ltd. extended its EM grid over the copper showing on the BL claim group north of Bode Lake, attempting to find an anomaly along a west-northwest trending fault structure south and west of the showing.

Trigg Woollett and Associates conducted a reconnaissance prospecting program for *Imperial Oil Ltd.* from Wopmay Lake to the Dismal Lakes (30). All known mineralized zones were examined. Geochemistry and geological mapping were done over several small occurrences but no claims were staked. A helicopter was used to do airborne radiometric surveys.

A private syndicate restaked the old FNS group on the west shore of Hottah Lake (31). Work done by the *Far North Syndicate* in 1965 found chalcopyrite and marcasite in cavity fillings in recrystallized ferruginous dolomite and along fracture surfaces. Although occurrences of mineralization are numerous, the indicated grade is low (.2% to 1% copper). The present syndicate completed a magnetometer survey over the claim groups in June.

Two copper showings were discovered in the Camsell River area during the year. One of these discoveries was a zone of chalcopyrite mineralization on the MJ claims south of Smallwood Lake. The chalcopyrite is distributed randomly in a quartz feldspar porphyry over an area of half a claim. Assay results give 0.2% to 1.2% copper from grab samples.

Saco Mining Corp. Ltd. did a radiometric and geological survey over its MR claims (65° 37.5'N, 118° 08'W) two miles northeast of the Terra mine. The company staked

The DC-3, once one of the "pack-horses" of the North, at Saw Mill Bay, N.W.T.



Twin Otter takes off from Little Cornwallis Island, N.W.T.



four claims to cover a copper showing at the west end of Alter Bay, where chalcopyrite and lesser pyrite is disseminated throughout a knoll of intermediate tuff.

Other Areas

Texas Gulf Inc. prospected areas of possible acid volcanics in the Regan Lake Area (33), the Itchen Point and Redrock Lake area (34) and the Takiyuak Lake area (35).

Coppermine River Ltd. geochemically surveyed a small portion of the Teshierpi Fault north of its Hope Lake ore body (36).

Mount Hyland Mines Ltd. conducted a magnetometer and IP survey over portions of the LIN and PIN groups of claims on the Liard River (37), some 65 miles southwest of Fort Simpson. The claims are underlain by Paleozoic shales, limestones and dolomites which are cut by steeply-dipping quartz-chalcopyrite veins.

Arrow Inter-American Corp. conducted a detailed prospecting program on its newly acquired prospecting permit in the O'Grady Lake area (38). The area is dominated by a large Cretaceous granitic pluton. This is surrounded by a 1,500 foot zone of altered sediments which contain gossans. Prospecting was extended to cover the area north and south of the Canol Road. Some 22 people, including 12 to 14 prospectors, were engaged in this program for a three-month period.

Aquitaine Co. of Canada Ltd. continued prospecting its permits on the southern Cumberland Peninsula on Baffin Island (39).

Silver

The Echo Bay (40) and Camsell River (32) areas continue to be the centre of silver exploration in the Northwest Territories. Surface drilling programs were conducted on both *Echo Bay Mines Ltd.*, and *Terra Mining and Exploration Ltd.* properties.

During the summer the old El Bonanza workings on Great Bear Lake were de-watered and de-iced. The first level workings revealed no silver mineralization in the backs, but some mineralization is reported to be present on the second level. An airborne magnetometer survey was completed in February on the REX claims for *Barons Oil Ltd.* who prospected the area in 1971. A total of 218 line miles were flown, mainly over granitic rocks.

Elsewhere *Colby Mines Ltd.* optioned the ED claims on the south shore of Great Slave Lake south of Preble Island (41). In 1971 silver was found in trenches on these

claims. Some seven holes totalling 1800 feet were drilled to test a structure running N 20° E from the trench containing the silver. Some cobalt bloom, galena and chalcopyrite were observed, but only traces of silver were seen in the core. On the same property, 1500 feet to the north east of the silver showing, trenching in 1972 revealed a shear containing abundant chalcopyrite. Assays of 3% copper over eight feet were obtained from trenches 25 feet apart along the strike of the zone.

During the summer the silver showings of *Roberts Mines Ltd.* south of Elu Inlet near Bathurst Inlet (42) were revisited by company officials.

Gold

The substantial rise in the price of gold caused a general reassessment of gold showing in the Northwest Territories. Several promising properties were restaked, but little physical work other than trenching was done during the year.

Giant Yellowknife Gold Mines Ltd., as operator for *Northbelt Yellowknife Mines Ltd.*, drilled 1000 feet in the vicinity of Berry Hill (43) to test possible shear structures.

Shield Resources Ltd. conducted additional bulk sampling and geological mapping in the area of its promising gold discovery at the south end of Clan Lake (44), 30 miles north of Yellowknife. A feasibility study is planned for this property, and if warranted, an underground exploration program will be undertaken. A bulk sample of 1,150 tons shipped to the Discovery mill in 1967 gave an average grade of .423 ounces of gold per ton. The gold occurs in large irregular masses of quartz in dacite.

Shield Resources Ltd. also conducted a widespread prospecting program looking primarily for gold in the area bordered by Contwoyto Lake on the east and Point and Itchen Lakes (34) on the west. Many gossans were visited and one was staked (ASP claims).

Duke Mining Ltd., put down three 500-foot holes beneath the No. 3 and 4 veins on the TA mineral claims in the Buckham Lake area (45).

Uranium

Uranium prospecting, at a low ebb, began to pick up toward the end of the year and probably more attention will be given to this mineral in 1973.

Pan Ocean Oils Ltd. conducted a geochemical soil sampling program in the vicinity of their Kazan Falls showing (46). The samples were analyzed for copper, total heavy metal and mercury.

Getty Mines Ltd. worked all summer on three permit areas in the Bear Geological Province, some 50 miles southeast of Port Radium (47). High values from a geochemical survey done in 1971 interested them in this area and the work in 1972 was an attempt to localize some of the indications of uranium mineralization.

Getty Mines Ltd. did some scintillometer prospecting in the area of Taltson Lake (48) during the early summer. No claims were staked.

A party from *Nissho-Iwai Canada Ltd.* conducted a trenching and geological mapping program on the Hope claim group on Nonacho Lake (49). Here pitchblende and uranium staining is confined to northeast-striking brecciated, quartz-filled fault and shear zones up to four feet in width. The party also examined areas of anomalously high uranium between Nonacho Lake and the McDonald Fault as defined by the G.S.C. Open File 101.

In May 1972, *Denison Mines Ltd.* did a ground magnetic survey over the VIT and TU claim blocks in the Donovan Lake area (50), looking for shears and fault zones which might contain uranium or copper mineralization.

Mokta Canada Ltd. optioned *Vestor Explorations Ltd.* Simpson Island claims (53) and from June to September conducted detailed geological studies which culminated in a small program of X-ray drilling over the uranium occurrences within the Sosan Group.

Nickel

Perry River Area (4)

Giant Yellowknife Mines Ltd. mounted a large drilling program on their seven prospecting permits in this area. A total of 8540 feet of drilling in 18 holes tested 17 anomalies detected by airborne EM and magnetometer

surveys during the 1971 program. In addition, several anomalies were located on the ground by ground EM and magnetometer surveys.

Perry River Nickel Mines Ltd. conducted ground magnetometer, EM and IP surveys over the OTOK copper-nickel showing east of Giant's permits. An electromagnetic conductor some 1,200 feet long was detected about 800 feet north of the main showing and this was matched by an IP conductor 2,000 feet long. The conductor is over granulite, which contains intrusions of gabbro and zones of pyroxenite. Two holes were drilled on the prospect in the fall.

Adera Mining Company Ltd., in partnership with three other companies, conducted a preliminary program over their 500 claims to the south and east of the OTOK showing. Several showings of copper-nickel mineralization were detected in the southern claim groups, but no further work was done.

Darnley Bay Area (51)

Arjay Kirker Ltd., in co-operation with Gulf Oil Ltd., conducted a seismic survey from Darnley Bay south across an extremely strong gravity anomaly.

Other Minerals

Great Plains Development Co. of Canada Ltd. mapped and trenched a fluorite showing located nine miles south of the McDonald Fault on the JANE claims (54). The fluorite occurs in fractures striking northeast and northwest in a porphyritic granodiorite. Some of the fluorite-bearing fractures can be traced for more than 300 feet.

Milchem International Ltd. optioned a barite deposit on the PEGGY claims a few miles east of Snowdrift (55) and trenched the deposit during the summer months.

Whitehorse, capital of the Yukon Territory. On the Yukon River, it is 390 miles south of the Arctic Circle and 900 miles northwest of Vancouver. Until 1953 the capital of Yukon was Dawson City.



Producing Mines

Six mines operated in the Yukon: four underground and two open-pit mines. Production from these mines included lead-zinc, silver, cadmium, coal, nickel, copper and asbestos, with lead-zinc accounting for 76% of the total. The operating mines are:

Silver-Lead-Zinc

Anvil Mining Corporation Ltd., operating a large open-pit mine located 130 air miles northeast of Whitehorse, is the largest producer in the Yukon. Production increased from 7,248 tons per day in 1971 to 7,935 tons per day in 1972. The company employed an average of 350 men during the year.

Anvil Mining Corporation

Location:	130 miles northeast of Whitehorse
Product:	gold, lead, zinc, silver
Rate:	7,935 tons per day
Tons Milled:	3,060,168
Grade:	11.7 per cent combined lead-zinc, 1 ounce silver per ton
Reserves:	59,940,000 tons
Employees:	350

Asbestos

Cassiar Asbestos Corporation Ltd., operating an open-pit mine at Clinton Creek, 50 miles northwest of Dawson City, produced 102,347 tons of fibre from 1,267,178 tons of ore mined. This mine employed an average of 223 persons during the year.

Cassiar Asbestos Corporation Ltd.

Location:	50 miles northwest of Dawson City
Product:	asbestos fibre
Rate:	4,635 tons of ore per day
Tons Milled:	1,267,178
Grade:	5.37 per cent fibre
Reserves:	18,750,000 tons
Employees:	223

Silver-Lead-Zinc-Cadmium

United Keno Hill Mines Ltd. continued milling at a rate of 220 tons per day with most of the production coming from the Elsa, Calumet and Husky Mines. Exploratory work continued at the No Cash Mine, the Sadie Ladue and several other properties on Keno Hill. The company employed an average of 265 men.

United Keno Hill Mines Ltd.

Location:	31 miles northeast of Mayo
Product:	silver, lead, zinc, cadmium
Rate:	220 tons per day
Tons Milled:	80,646
Grade:	6.4 per cent lead, 1.5 per cent zinc, 56.8 ounces /ton silver
Reserves:	65,000 tons (56.8 ounces of silver per ton; 6.4 per cent lead; 1.5 per cent zinc) plus 26,000 tons at 40 ounces silver per ton
Employees:	265

Copper

Whitehorse Copper Mines Ltd., formerly New Imperial Mines Ltd., resumed production in December from its mine near Whitehorse. Prior to closing down in 1971, ore was mined from open-pits. Ore is now being mined from a new underground operation developed during the last two years. The development and construction program required an average work force of 127 persons during the year.

Whitehorse Copper Mines Ltd.

Location:	7 miles south of Whitehorse
Product:	copper, silver, gold
Rate:	2,400 tons of ore per day
Tons Milled:	10,707
Grade:	2.38 per cent copper
Reserves:	3,000,000 tons of 2.38 per cent copper
Employees:	127

Coal

Tantalus Butte Coal Mine, operated by Anvil Mining Corporation Ltd., continued mining coal at the rate of 80 tons per day with a work force of 17 persons. The coal is used at the Anvil silver-lead-zinc mine for drying concentrates.

Tantalus Butte Coal Mine

Location:	Carmacks, Y.T.
Product:	coal
Rate:	80 tons per day
Tons Mined:	18,435
Grade:	thermal coal
Employees:	17

Nickel-Copper

Hudson-Yukon Mines Ltd. started production in May 1972 at a rate of 600 tons per day. Concentrates are shipped by road to Haines, Alaska, for further shipment by deep sea vessel. In the fall of 1972, the Company announced that the mine could close in early 1973 due

to "lack of continuity in the ore body and poor ground conditions". The mine was still in operation at the end of 1972.

Wellgreen Mine	
Location:	Quill Creek, Y.T.
Product:	nickel, copper
Rate:	356 tons per day
Tons Milled:	106,087
Grade:	2.04 per cent nickel; 1.42 per cent copper; 0.065 ounces per ton platinum metals; 0.073 per cent cobalt
Reserves:	not available
Employees:	100

Mineral Exploration

Mineral exploration activity was carried out throughout the Territory. New finds are reported in the Hess Mountains, Selwyn Mountains near Summit Lake and the Hoole River areas. Some 6,845 mineral claims were recorded in the Yukon for 1972.

Copper

Hudson Bay Exploration and Development Co. Ltd. undertook a re-evaluation of claims owned by Whitehorse Copper Mines Limited, immediately west of the City of Whitehorse (56). During the fall of 1972 the company put six diamond drill holes beneath the War Eagle open pit (105-D-11, 60° 38'N, 135° 05'W). New Imperial Mines Limited (the predecessor of Whitehorse Copper Mines Ltd.) removed 800,000 tons of ore grading one per cent copper from this pit, during 1970 and 1971. The diamond drill intersected the skarn-limestone and quartzite host rocks.

Three holes were drilled on the old Pueblo Mine site, a bornite-rich skarn deposit which had been mined during World War I. The rock sequence here is diorite followed by vuggy limestone.

Dawson Range Joint Venture explored the Williams Creek (57) 420 claim property (115-I-7, 62° 22'N, 136° 43'W). The geochemical soil survey, on a 200 by 400-foot grid was successful in delineating anomalous zones in all areas except those with deep till. Soil surveys completed over much of the property indicated several more anomalies. The anomalies were immediately examined by bulldozer trenching and diamond drilling. A total of 5,000 feet of drilling and 26,000 cubic yards of trenching was completed.

Silver City Mines Limited resumed work on the White River (58) property (115-F-15, 61° 47'N, 140° 47.5'W).

The property was inactive in 1971 following extensive surface work consisting of geophysical surveys and diamond drilling in 1969 and 1,100 feet of underground exploration in 1970. Work in 1972 consisted of 2,000 feet of diamond drilling in 20 holes fanned out from four drill stations in the adit and drifts.

The drill program confirmed that the mineralization consists of irregularly distributed native copper, from fine grains to masses of several pounds, associated with chalcocite. Native copper and chalcocite are also present as fine veinlets in the amygdaloidal and porphyritic basic volcanic host rock.

Silver Standard Mines Ltd. (with Asarco participation) continued diamond drilling and trenching of its Minto property (59) (115-I-11, 62° 33'N, 137° 25'W). Roughly 10,000 feet in 19 holes were completed, of which 6,000 feet were drilled in 1972. The mineralized zone was intersected by bulldozer trenches. A 3,000-foot airstrip was completed at the end of the 1972 season.

As on the nearby United Keno Hill property, outcrop is poor and most geological information is obtained from trench mapping. Chalcopyrite is disseminated in several zones in biotite-bearing gneissic granodiorite. Bornite and chalcopyrite are also present in veins cutting the foliation.

United Keno Hill Mines Limited continued exploration on the DEF claim group (115-I-11, 62° 33'N, 137° 25'W) west of Minto. Following soil geochemistry, EM, IP, magnetometer and geological surveys in 1971, a north-west-trending shear zone mineralized with copper, was recognized. During 1972, the company completed fill-grid soil sampling and put in 2,000 feet of bulldozer trenches across the main mineralized zone.

The area is one of little exposure, probably less than two per cent. Bedrock type is quartz-biotite feldspar gneiss, with variable amounts of hornblende and biotite, biotite schist, porphyritic granodiorite, monzonite and quartz monzonite with minor amounts of fine-grained intrusive material as well as northwest trending aplite and pegmatite dykes. The rocks are cut by southwest trending faults and in the area of malachite stain, by a prominent joint system.

Caltor Syndicate holds the 10-claim KART group in the east side of Lake Laberge (105-E-3, 61° 04'N, 134° 03'W). The claims staked in 1971 over old claims are



underlain by a feldspar porphyry stock, which cuts Lewes River limestone. Chalcopyrite and bornite are scattered through the porphyry and in diopside skarn at the contact. Soil geochemistry, an EM survey, and geological mapping were completed during the field season.

Consolidated Standard Mines Limited holds the B and SEE claim groups 12 miles west of Minto (115-I-11, 62° 40'N, 137° 13'W) (60). Geological mapping and a soil survey were conducted over these claims during the 1972 season.

Wainco Oil Limited holds 64 WAIN claims 10 miles west of the Silver Standard-Asarco Minto property (115-I-11, 62° 38'N, 137° 30'W). The 1972 work consisted of a reconnaissance soil geochemical survey.

Northair Mines Limited's AL claims lie northwest of the Silver Standard property. Copper minerals and minor molybdenite are present in gneissic zones in the granitic rocks. Soil geochemistry indicated copper, silver and molybdenum anomalies.

South Yukon Joint Venture, on the ALP claims (115-H-9, 61° 37'N, 136° 11'W) on ground formerly known as Macks Copper (61) and explored at various times since 1904, conducted a geochemical soil survey which indicated a copper anomaly near pyrite zones in volcanic rocks.

Dawson Range Joint Venture explored the PAL, KAP and BEN claim groups (115-I-11, 62° 42'N, 137° 12'W) adjacent to the Silver Standard-Asarco Minto property (60). The property is underlain by Klotassin granodiorite capped by basalts, andesites and porphyritic dacites of the Carmacks volcanic series. Malachite, with minor chalcopyrite, bornite and chalcocite is present in gneissic phases of the granodiorite. The 1972 work consisted of geological mapping and soil geochemical surveying.

Wolf Lake Joint Venture completed detailed geological mapping and a magnetometer survey on the copper prospect on the MUNG claims on Wolf River (105-B-12, 60° 42'N, 131° 45'W) two miles west of Wolf Lake (62). In this area of very sparse outcrop, chalcopyrite was found in altered, intrusive breccia.

New Jersey Zinc Exploration Company (Canada) Limited held an option on the GROUSE claims west of Whitehorse (105-D-11, 60° 37'N, 135° 40'W) (56) and did 2,000 feet of diamond drilling. Later in the year the owners put in some bulldozer trenches on this prospect. Host rocks

and mineralization pattern is similar to that in parts of the Whitehorse Copper Belt; chalcopyrite, bornite and magnetite in veins and irregular bodies near the contact between quartz-diorite and limestone and their related calc-silicate rocks.

Phelps Dodge Corporation of Canada Ltd. in 1971 staked 144 claims, the PDM group north of the South Macmillan River (63) and 24 miles west of Mile 62 on the North Canol Road (105-J-13, 62° 51'N, 131° 38'W). During 1972 the company did geological mapping, silt and soil sampling and a magnetometer survey. Blasting and trenching showed some chalcopyrite and pyrrhotite. The claims are underlain by chert, shales, quartzite and a chert pebble conglomerate, cut by biotite-hornblende quartz monzonite. The sulphides are associated with mafic rock blebs in the intrusive rocks.

Copper-Molybdenum

Canadian Occidental Petroleum Limited staked the 212 claim BIR group northeast of Burwash Lake (115-G-9, 61° 40'N, 138° 20'W) (64) in 1971 on the basis of reconnaissance geochemistry. More detailed geochemical sampling and geological mapping was carried out in 1972.

Canadian Occidental Petroleum Limited examined several claim groups in the Nisling Range north and east of Kluane Lake, which were staked on the basis of earlier reconnaissance geochemistry. Claim groups ONI, RYE, TYR and THATCH (115-H-13, 115-G-16, 61° 35'-53'N, 137° 45' - 138° 39'W) are in an area of Nisling Range granitic rocks and Yukon Group metasediments. Work consisted of soil and rock geochemistry and detailed geological mapping.

Canadian Occidental Petroleum Limited, following geochemical surveys, geological mapping and an IP survey in 1971 on the PELLY claims (115-I-14, 62° 50'N, 137° 25'W) (60), did 1,500 feet of diamond drilling in August on the property.

Cyprus Exploration Corporation continued the re-examination of Mount Nansen (65) and surroundings (115-I-3, 62° 03'N, 137° 07'-10'W). This property, a silver-gold producer for several months in late 1968 and early 1969 is being explored for copper-molybdenum possibilities. On the basis of work done in 1971, a small drilling program was carried out in September and October of 1972.

Pictures of the Past

1. Norseman, which replaced the Bellanca, was used in the North from about 1935.
2. The Ford Tri-Motor "Tin Goose".
3. Junkers JL-6, which in 1921 was one of the first aircraft to land in Northwest Territories.
4. Queen of the Yukon, a Ryan Broughton, was a sister aircraft to Lindbergh's Spirit of St. Louis.
5. Fairchild 71 at Fort Resolution, Great Slave Lake.
6. Condor biplane at Mayo airport, Yukon Territory.





MINERAL EXPLORATION AND MINING - YUKON & N.W.T.

SCALE OF MILES
0 100 200 300 400

LEGEND



PRODUCING MINE

RAILWAY



AREAS OF ACTIVITY

EXISTING ROAD

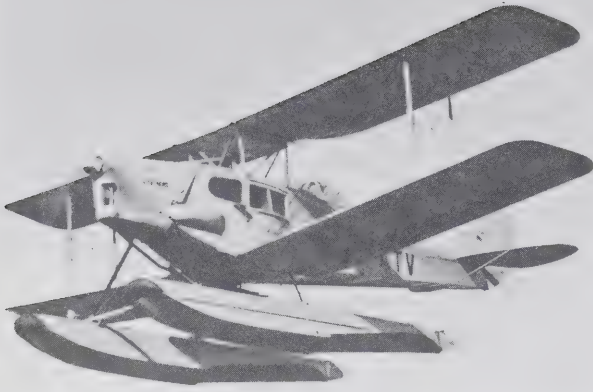
COMMERCIAL AIR ROUTE

- | | |
|--|---------------------------------------|
| A Giant Yellowknife Mines Ltd. Au | I Tantalus Butte Coal Co. Coal |
| Con-Rycon Mine Au | J Hudson-Yukon Mine Ni Cu |
| B Echo Bay Mines Ag Cu | K Terra Mining & Expl. Ltd. Ag |
| C Canada Tungsten Mining C. Ltd. WCu | Federated Mining Corp. Ltd. Ag |
| D Pine Point Mines Ltd. Pb Zn | |
| E United Keno Hill Mines Ltd. | |
| Pb Zn Ag Cd | |
| F Whitehorse Copper Mines Ltd. Au, Ag, Cu | |
| G Cassiar Asbestos Corp. Ltd. Asb | |
| H Anvil Mining Corp. Ltd. Pb Zn Ag | |

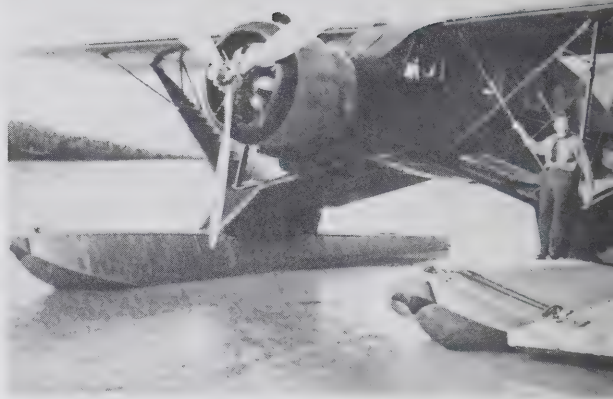


7. A Fox Moth equipped with floats.
8. Junkers W 34 float-equipped for northern service.
9. Gypsy Moth equipped for winter landings.
10. Bellanca Air Cruiser used in early 30's is seen at Dawson City, Y.T.
11. Wardair Bristol unloading fuel drums on ice strip at mining exploration site.
12. Junkers JU 52 IM Flying Boxcar.

7



10



8



11



9



12



Molybdenum

Canadian Occidental Petroleum Limited staked 56 ARK claims 20 miles southwest of Whitehorse (105-D-12, 60° 36'N, 135° 39'W) (56) on the basis of its 1971 reconnaissance stream geochemistry program. During 1972 the company completed geological mapping and soil and rock geochemistry on the prospect. Claims are underlain by hornblende-biotite granodiorite cut by biotite granite and numerous north trending dykes. Molybdenite occurs in quartz stringers and as disseminations in the granodiorite.

Silver-Lead-Zinc

Bullion Mountain Mining Limited (106-D-2, 64° 08'N, 134° 57'W) (66) worked all season with a crew of 10 men. The road in from McQuesten Lakes was reopened and several open cuts were made on the claims. Two areas were surveyed by IP: the first in and around the stripped, trenched area having visible galena veins; the second over the ground shown to be anomalous by an earlier gravity survey. Diamond drilling of the gravity highs gave barren core. Drill targets selected on the basis of combined IP and gravity surveys were more fruitful, with galena-bearing core being recovered. The geological setting is one of narrow galena veins in strongly deformed quartzite and quartzose phyllite. These veins are wider in adjacent limestone and are the most promising exploration targets.

Canex Placer Ltd. staked 450 claims on its Nahanni lead-zinc prospect (105-I-5, 62° 28'N, 129° 13'W) during the 1972 field season. The Company did follow-up prospecting near Summit Lake on the basis of 1971 reconnaissance geochemical work. Galena and sphalerite were discovered in Paleozoic sediments in July. A bulldozer was brought in and several trenches were cut in a mineralized zone. The belt staked by Canex is one to three miles wide and some 25 miles long, crossing the irregular Yukon-N.W.T. border.

Word of the Canex activity stimulated a staking rush in the fall and early winter, and by year's end, some 5,000 additional claims were staked. This is the first big rush since the Casino activity in 1969.

Cyprus Exploration Corporation Limited, with an option on the LYN claim group (105-K-3, 62° 06'N, 133° 15'W) from *Kerr Addison Mines Limited*, continued exploration of the prospect by diamond drilling, completing 2,000 feet in three holes. The property, on the south side of the Tintina Trench, some 12 miles southwest of Swim Lakes (67), is underlain by calc-silicates with minor schists containing galena and sphalerite.

Atlas /Dynasty joint venture explored the PLATA and INCA claim groups in the Hess Mountains near the Rogue River (68) (105-N-9, 63° 35'N, 132° 02'W). Following hand trenching, prospecting, geological and geochemical surveys, the company drilled six holes to test the most attractive target, a 5 to 20-foot wide vein consisting of quartz with galena, sphalerite and tetrahedrite. The mineralized quartz veins occur at a quartzite-slate contact.

United Keno Hill Mines Limited continues active exploration at the mines presently in production at Elsa (105-M-14, 63° 55'N, 135° 29'W) (66). The company has developed a system of churn drilling from surface into the underlying bedrock through the rubble, most of which has moved down slope. By this method they have detected the hidden outcrop positions of numerous lead-zinc-silver veins. During 1972, two adits, named the Townsite and the Dixie, were being driven to intersect the projections of veins indicated by the overburden drilling.

Getty Mines Limited optioned the TAM 25-55 claims (69) (95-E-5, 12, 61° 30'N, 127° 34'W) in 1971. The claims lie on the N.W.T.-Yukon border, but most are in the Yukon. The company was seeking stratabound sulphides in the area surrounding the original showing. Some diamond drilling was done to test a coincident magnetic-EM-geochemical anomaly near the showing. The claims were underlain by Cambrian sediments cut by biotite-quartz monzonite. The garnet-diopside skarn at the contact of the limestone-monzonite contact contains, in places, pyrrhotite with galena, sphalerite and rare magnetite.

Whitehorse Silver Mines Limited worked on its Idaho Hill (70) property 28 miles southwest of Whitehorse (105-D-6, 60° 18'N, 135° 04'W). Silver-bearing minerals were recognized on Idaho Hill in low grade veins in the late 19th century. Interest was renewed with portions staked and examined from the 1960's on. Arkose, greywacke and tuff of the Laberge Group are cut by porphyritic granodiorite and feldspar porphyry dykes. Sheared, irregular quartz-calcite veins contain galena, sphalerite, pyrite and arsenopyrite. The 1971 soil geochemistry results were corroborated by a 1972 EM survey, which aided in tracing several veins.

Dusty Mac Mines Limited holds the MAX and MAR claim blocks near the headwaters of the Hyland River (105-H-7, 61° 17'N, 128° 44'W) (71). During the field

season the company conducted ground magnetic and soil geochemical surveys and did some trenching. Galena and sphalerite occur as lenses in an epidote bearing skarn. Scheelite is irregularly distributed in the skarn.

Anvil Group (Canadian Reserve Oil and Gas Limited, Overland Exploration Services Limited, Aquitaine Company of Canada Limited, Canadian Southern Petroleum Limited, Canadian Occidental Petroleum Limited and Husky Oil Ltd.) of companies completed their follow-up work on earlier detected gravity anomalies on several claim groups in the Swim-Vangorda-Anvil belt (72). Claim groups are the ARROW, LEA, MARK and BLUE COLT. The claims lie on or near the contact between the Anvil Batholith and the surrounding schists. Work consisted of geological mapping, IP, and some gravity surveying.

Anvil Mining Corporation Limited conducted exploration drilling near the mine (105-K-6, 62° 21'N, 133° 22'W) (72) and on a series of claim blocks in the immediate Swim Lakes area. Overburden drilling for geological information and diamond drilling, along with geological mapping, ground geophysics and geochemistry, continued on several claim blocks.

Peso Silver Mines Ltd. conducted a brief diamond drilling program to re-examine the silver-lead prospect between Secret Creek and Dublin Gulch (73), northwest of Mayo (105-M-13, 64° 00'N, 135° 54'W). The property was active in 1967, at which time an adit was driven and several open cuts were made.

Atlas Explorations Limited in joint venture with *Dynasty Explorations Limited*, *Midwest Oil Production Limited*, *General Crude Oil Company* and *Aquitaine Company of Canada Ltd.* completed EM and gravity surveys on the CAPA-ECHO-DELTA claim groups (72) (105-K-2, 62° 12'N, 132° 45'W) and diamond drilled the more promising geophysical anomalies.

Rackla River Mines Ltd. did some surface work on the Kathleen Lakes (74) silver-lead prospect 80 miles northwest of Mayo (106-D-4, 64° 08'N, 137° 57'W). The showings consist of silver bearing galena-sphalerite veins in limy and siliceous sediments.

Zinc

Hudson Bay Exploration and Development Company Limited did a brief drilling program on its ROG property near the MacMillan River (105-K-10, 62° 40'N, 132° 55'W) (75). Claims were staked in 1971 on the basis of geochemical prospecting.

Tungsten

Wolf Lake Joint Venture following staking of the TUNG claim group (105-B-10, 60° 37'N, 130° 33'W) (76) in 1971 and initial mapping and geochemical sampling, completed a soil sample grid in 1972. A low grade tungsten-bearing skarn zone occurs in a carbonate horizon within schists and gneisses of Cambrian or older age at the margin of the Allan Batholith.

Amax Exploration Incorporated continued exploration of its promising Mac Tung tungsten deposit north of Macmillan Pass (52) (105-O-8, 63° 17'N, 130° 05'W) on the N.W.T.-Yukon border. Discovered and staked in 1967, geological mapping was done in 1967. Diamond drilling in 1968 and 1971 totalled 12,000 feet. The 1972 work consisted of 20,000 feet of diamond drilling and detailed core logging. The scheelite is present in skarn at the contact of lower Paleozoic limy sediments and a Cretaceous quartz monzonite stock. Amax recently announced that more than 30 million tons of tungsten-bearing rock have been outlined on this property with an indicated average grade of 0.9 per cent tungsten trioxide. An underground development, sampling and drilling program will be carried out in 1973.

Coal

Teslin Exploration Ltd. resumed work on its coal licence areas southwest of Braeburn (115-H-8, 61° 18'N, 136° 02'W) (77), having trenched there in 1970. The 1972 work, consisting of 2,000 feet of diamond drilling, was to explore for additional seams and to verify the continuity at depth and along strike of the 30-foot seam exposed at surface by the bulldozer trenching.

Northern Natural Resources and Environment Branch

The Branch is responsible for the management of all northern resources and for advancing the economic development of northern Canada. Its tasks are to seek out and identify all possible ways and means of expanding the economy of the North at a more rapid pace; to develop a broad plan of economic progress and to recommend specific programs and policies for achieving these objectives.

The Branch also undertakes feasibility studies relating to northern development in order to create a suitable climate of opportunity for investment. Studies include such matters as transportation, smelters, townsite planning, power, etc. Financial assistance is provided for projects that are essential to the development of northern resources, one example being the construction of the Great Slave Lake Railway, which was undertaken to permit the development of Pine Point Mines.

The Branch is responsible also for establishing appropriate resource and economic development programs in line with the federal government's objectives. To meet these objectives the government has instituted many assistance programs to help the mineral industry overcome some of the high costs of operating in the North. These include the Northern Mineral Exploration Assistance Program, Prospectors' Assistance Program, Road and Airstrip Assistance Programs and Assay Services. In addition, financial support is given to organizations which assist in northern mineral development, such as Chambers of Mines and Accident Prevention Associations.

In order to discharge its functions, the Branch is subdivided into Oil and Mineral Division and Water, Lands, Forests and Environment Division.

This publication provides details of mining activity north of 60°, and since the management of mining lands in this region rests with the Oil and Mineral Division, the responsibilities of that Division and its Mining Section are described in more detail on the following pages.

The Oil and Mineral Division is responsible for:

- a) the management and administration of Crown mineral rights in the Yukon Territory and Northwest Territories, including offshore areas lying north of the line described in the schedule to Order in Council P.C. 1965-2284;
- b) the formulation and recommendation of policies designed to encourage resource exploration and development, including the terms of disposal of mineral rights;

- c) the planning and assessment of programs designed to provide an adequate infrastructure so that the natural resources, when found, can be profitably developed and delivered to market;
- d) the evaluation of natural resource exploration and development projects to determine whether they qualify for any of the assistance programs available and /or government support in other areas;
- e) the assessment of national fiscal policies and subsidy programs as they affect northern natural resources;
- f) the administration of industrial safety legislations; and
- g) representing the Department in discussions with the industries concerned and with other departments in the resources field.

Officers responsible for the administration of the above program of work are listed in the table following.

Department of Indian Affairs and Northern Development

Minister: Jean Chrétien, Ottawa, Ontario

Deputy Minister: H. B. Robinson, Ottawa, Ontario

Assistant Deputy: A. D. Hunt, Ottawa, Ontario.

Northern Natural Resources and Environment Branch

Director: F. J. Joyce, Ottawa, Ontario

Regional Director (Y.T.): B. J. Trevor, Whitehorse, Y.T.

Regional Director (N.W.T.): G. B. Armstrong, Yellowknife, N.W.T.

Oil and Mineral Division

Chief: H. W. Woodward, Ottawa, Ontario

Mining Section

Administrator of Mining: J. D. Kelland, Ottawa, Ontario

Mining Lands Unit

Head: Ottawa, Ontario

Supervising Mining Recorder: B. R. Baxter, Whitehorse, Y.T.

Mining Recorders: F. V. Daly, Ottawa, Ontario

O. C. Paton, Dawson, Yukon Territory

R. G. Ronaghan, Mayo, Yukon Territory

W. B. Jewett, Watson Lake, Yukon Territory

R. L. Williams, Yellowknife, Northwest Territories

Engineering and Inspection Services Unit

Chief Mining Engineer: S. Homulos, Ottawa, Ontario

Resident Mining Engineers: G. Needham, Whitehorse, Y.T.
M. L. Brown, Yellowknife, N.W.T.

District Mining Engineer: T. G. Csizmazia, Whitehorse, Y.T.
E. Bengts, Yellowknife, N.W.T.

Mine Rescue Superintendents: N. Boss, Yellowknife, N.W.T.
J. D. Barraclough, Whitehorse, Y.T.

Exploration and Geological Services Unit

Head: A. D. Oliver, Ottawa, Ontario

Resident Geologists: D. B. Craig, Whitehorse, Y.T.;
M. Milner, Whitehorse, Y.T.; R. W. Hornal, Yellowknife,
N.W.T.; P. J. Laporte, Yellowknife, N.W.T.; W. A. Padgham,
Yellowknife, N.W.T.; T. W. Caine, Ottawa, Ontario.

Mining Section

This section is responsible for the administration of mining and mineral rights (excluding oil and gas) from the acquisition of claims through to the production stage, including safety in mines. The section is comprised of three units – Mining Lands, Exploration and Geological Services, and Engineering and Inspection Services. The responsibilities for their operation rest with the Administrator of Mining.

Mining Lands Unit

For administrative purposes the Territories have been divided into seven mining districts, each of which has been allocated a Mining Recorder and supporting staff. The Mining Recorders are responsible for the disposition of the mineral rights within their respective districts in accordance with the legislation applicable. For each Territory there is a Supervising Mining Recorder whose principal function is to ensure that uniform practices are observed in the administration of the various mining acts and regulations. When necessary, the Supervising Mining Recorder interprets such acts and regulations and prepares directives and instructions.

During the past year, work continued on development of a computer program for mining claim records in the Arctic and Hudson Bay Mining District, as the office for this district and the technical personnel responsible for computer systems are both located in Ottawa. Refinements are continually being made to the program and it is expected that the system will be fully operational in late 1973. It is planned to implement the system at Yellowknife (Office of the Mining Recorder for the Mackenzie and Nahanni Mining Districts) in 1974. It is further expected that by 1975 all recording offices for the Yukon Territory and Northwest Territories will be completely computerized.

In conjunction with the computer system, a microfilming program also has been undertaken. In 1972 all records for the Arctic and Hudson Bay Mining District, as well as those in the Yellowknife and Dawson City Mining Recording offices, were completed. By the end of 1973 the records in both territories will be completely filmed.

The districts and locations of Mining Recorders' offices are as follows:

	District	Office
<i>Yukon Territory</i>	Mayo	Mayo, Y.T.
	Dawson	Dawson, Y.T.
	Watson Lake	Watson Lake, Y.T.
	Whitehorse	Whitehorse, Y.T.
<i>Northwest Territories</i>	Mackenzie	Yellowknife, N.W.T.
	Nahanni	Watson Lake, Y.T. (Moved to Yellowknife in 1973)
	Arctic and Hudson Bay	Ottawa, Ontario

Mineral claims staked and recorded in the Yukon Territory and Northwest Territories during 1972, with comparative figures for 1971, are tabulated below:

Yukon Territory

District	Claims Recorded	
	1971	1972
Whitehorse	4,380	1,900
Dawson	1,054	600
Mayo	1,026	1,700
Watson Lake	1,245	2,400
Total	7,705	6,600

Northwest Territories

District	Claims Recorded	
	1971	1972
Mackenzie	5,188	2,900
Arctic and Hudson Bay	1,371	2,000
Nahanni	146	500
Total	6,705	5,400

Engineering and Inspection Services Unit

Headed by the Chief Mining Engineer for the Yukon and Northwest Territories stationed at Ottawa, this unit is responsible for all inspections, including safety inspections of mines and mills, claims inspections, assessment work on claims, and other industrial operations north of the 60th parallel. It is responsible also for the preparation of new safety legislation, mine rescue and first aid training, operation of assay services and all other technical matters pertaining to mining.

Resident Mining Engineers are located at Whitehorse, Yukon Territory, and at Yellowknife, in the Northwest Territories.

Mine Rescue

An additional 5 Draeger Units were added in the Northwest Territories during 1971. The present disposition of Draeger Equipment is as follows:

Yukon

Mine Rescue Station	12
United Keno Hill Mines Ltd.	11
Tantalus Coal Company	5
Hudson Yukon Mine	5
Whitehorse Coppermines Ltd.	5

Northwest Territories

Central Station	30
Echo Bay Mines	6

The sixth Canadian Mine Rescue Competition was held at Victoria on June 24, 1972, with teams from British Columbia, Alberta, Nova Scotia, the Yukon Territory, and the Northwest Territories competing. The mine Rescue Team from the Devco Coal Mine in Nova Scotia took first place and the Giant Yellowknife team from the Northwest Territories won the trophy for metalliferous mines, donated by the United Steel Workers Union.

Mining Safety Statistics – Yukon and Northwest Territories

The American Standard method of recording work injuries is used throughout, and in the case of accidents resulting in death, permanent total disability and permanent partial disability, the number of days recorded as lost time as a result of these accidents conforms with the scheduled time charges set down in the above noted Standard.

Disabling injuries are defined as those which result in death, permanent total disability, permanent partial disability or temporary total disability.

Days recorded as lost time are calendar days lost, but do not include the day of the accident or the day of return to work.

Accident frequency is expressed as the number of accidents per 1,000,000 man-hours worked.

Accident severity is expressed as the number of days lost, as a result of accidents, per 1,000,000 man-hours worked.

Accident Statistics – 1972

In 1972 there were 80 disabling injuries reported in the Yukon Territory. The accident frequency for disabling injuries decreased from 39 in 1971 to 31 in 1972. Accident severity increased from 1,208 in 1971 to 3,217 in 1972. "Fall of persons" was the chief cause of accidents in the Yukon, accounting for 27 per cent of all accidents, followed by "Miscellaneous causes" and "Strain while lifting". These three main causes accounted for 65 per cent of all accidents reported. One fatal mining accident occurred in the Yukon Territory in 1972. On June 27, at Hudson Yukon Mining Co., a mucker was instantly killed when he was crushed between a runaway ore car and the wall of the drift.

In the Northwest Territories 61 disabling injuries were reported. Accident frequency decreased from 22 in 1971 to 20 in 1972, while the severity decreased from 6,670 in 1971 to 2,930 in 1972. "Fall of persons" and "Fall of rock" were the chief causes of accidents, accounting for 37 per cent of all accidents reported.

One fatal accident occurred in the Northwest Territories in 1972. On Oct. 26, a trolley operator was killed when crushed between a derailed mine car and the ground.

Exploration and Geological Services Unit

This unit provides a geological information and advisory service to those engaged in the mineral industry in the Yukon and Northwest Territories. Resident Geologists' offices are maintained in Whitehorse, Yukon, and Yellowknife, Northwest Territories. Geological Survey of Canada publications, such as geological, geophysical and topographical maps, memoirs, papers and reports, are available for sale to the public.

A library of released technical assessment reports is available for reading and copying by means of a microfilm system. A small library of technical books and mining publications is maintained also for public convenience.

Resident and District Geologists carry out mineral property examinations, collect rocks and mineral specimens and advise the mineral industry, government departments and research scientists on geological problems arising from their work in the Territories. The service entails carrying out engineering and geological evaluations on mining developments in the Yukon and Northwest Territories where government assistance is solicited, such as for the Prospectors' Assistance Program, the Northern Mineral Exploration Assistance Program and the Northern Airstrip Assistance Program.

The Department geologists assist prospectors and geologists by indentifying rock and mineral specimens, giving prospectors' training courses, preparing geological compilation maps on mineralized areas and giving direction when requested.

The staff evaluates all geological, geophysical, geochemical and other related work submitted in respect of representation work performed on mineral claims and work commitments on prospecting permits. Summer field surveys are carried out under the direction of the Resident Geologists as part of the mineral deposit inventory program. In 1972 the following work was completed and released to the public through the publication and open-file systems of the Geological Survey of Canada.

GSC List No. 768 Mineral Industry Report 1969-70 Vol. 1 "Yukon Territory and Southwestern Sector, District of Mackenzie" by D. B. Craig and P. LaPorte.

G.S.C. O.F. 129 Lake-sediment geochemical sampling survey in the following areas: Yellowknife, Indin Lake and portions of the Cameron River and Beaulieu River, Greenstone Belts by D. Nickerson, P. Eng.

G.S.C. O.F. 135 Preliminary Geology map of Camsell River Silver District by R. J. Shegelski and J. D. Murphy, scale five inches to one mile. Compilation geological map of Rainy Lake N.T.S. area 86/E/9 by J. D. Murphy, scale ½ inch to one mile.

Papers

Copies of the following papers are available at the Resident Geologists' Offices or in Ottawa:

*A Review of Mineral Exploration in the Keewatin District Northwest Territories**

by P. J. LaPorte, 1972

*Northern Canada Mineral Exploration 1972***

by P. J. LaPorte, W. A. Padgham, D. B. Craig

Mineral Exploration North of 60°

*Trends and Achievements 1971***

by R. W. Hornal and D. B. Craig

A Critical Review of Northern Mineral Potential 1970

by D. B. Craig and J. A. Kelly

Abstracts of the N.W.T. Chamber of Mines Exploration Symposium by Exploration and Geological Service

Reports in Preparation

1. Mineral Industry Report 1971 Volumes I, II and III, Yukon Territory & Northwest Territories.
2. Mineral Industry Report 1972 Volumes I, II and III, Yukon Territory & Northwest Territories.
3. Mineral Industry Report 1969-70 Volume II Northwest Territories west of 104° West longitude.
4. Mineral Industry Report 1969-70 Volume III Northwest Territories east of 104° West longitude.
5. Geology Compilation Map, Rankin Inlet 55-K-16

Preliminary Studies

The following preliminary reports are on open file at the Resident Geologist's office in Yellowknife, N.W.T.:

1. Base Metal Sulphide Metallogeny in the Slave Structural Province, N.W.T., by W. J. Johnston, University of Western Ontario.
2. Preliminary Study on Metal Dispersion Patterns in L. Sediments and the relationship to mineralization in the Yellowknife and Indin Lake areas, by R. G. Jackson, Exploration Geochemistry Group, Department of Geological Service, Queen's University.

*Presented at the Northwest Territories Chamber of Mines Exploration Symposium, Yellowknife, N.W.T. February 1972.

**Papers presented at the Prospectors and Developers Association Conventions, Toronto, Ontario. Preliminary study and maps.

Programs in 1973

In 1973 the Exploration and Geological Service will carry out the following studies:

- Metal dispersion patterns in Lake Sediments, Yellowknife area.
- Base metal sulphide metallogeny in the Slave Structural Province.
- Geological control of ore distribution in the Whitehorse Copper belt.
- Geological Compilation Maps will be prepared and field checked in the following areas:
Rankin Inlet area 55-J-13,
Camsell River Area 86-E-8,
High Lake Area,
Beaulieu River Area.
- Compilation of mineral deposit maps of the Bear and Slave Province.
- Study of coal deposits in the Yukon.
- Study on the Yukon Placer operations.
- Geology Compilation Montana Mountain area, Yukon Territory.

Development and Incentive Program Section

This section initiates, implements and maintains policies, development programs, and projects designed to stimulate the exploration for non-renewable resources in the Yukon and Northwest Territories.

The Government has developed a series of incentive programs designed to aid both companies and individuals in exploration and development activities in the North. These incentives can be broken down into three categories, namely: the provision of infrastructure, the provision of direct financial assistance, and the provision of technical assistance.

Provision of Infrastructure *Northern Roads Program*

The Northern Roads Program, which was approved by the Federal Government in 1965, called for an annual expenditure of \$10 million for the following 10 years in both Territories. It is the first phase of a long-range, 20-year program designed to bring permanent roads to within 200 miles of all potential areas of resource development. The

policy was designed to be sufficiently flexible to allow revisions in priorities from year to year to keep pace with resource development. It also allowed for shift in volume of construction from one territory to another, depending on the requirements and based on northern territorial development.

Experience in administering the Northern Roads Program over the past six years had indicated the need to make certain changes in the policy. A revised policy document entitled "Northern Road Policy 1971" was approved on December 21, 1971.

One of the main features of the revised policy is the provision for the construction of Pioneer Roads. This new road category is designed to provide low cost access into undeveloped areas of favourable natural potential.

The new policy also provides for conservation measures, which will further protect the northern land environment and minimize surface disturbance from transportation operations. It also includes provision for undertaking river crossing studies in light of future bridge constructions and for revision in road standards so that the type of road structure meets the needs of changing traffic patterns and designated load limits.

In order to achieve the objectives of the Northern Roads Policy, classification of roads was established wherein cost sharing formulas between Federal-Territorial-Private interests were defined. In this classification, there are two main categories of roads – (a) Communication and Network Roads and (b) Lateral Roads.

a) Communication and Network Roads are those highways and roads which provide a primary network of roads in the N.W.T. with connecting links to the Provinces. Their initial cost is borne completely by the Federal Government. Federal Government supplies 85% of maintenance costs, the Territorial Government 15%.

Listed under this category are:

- Trunk Highways
- Secondary Trunk Roads
- Airport Roads

Since 1965 when this multipurpose \$100 million, \$10 million-a-year program was commenced, 836 miles of new roads at a cost of \$77.7 million have been constructed. Currently, the principal targets for the Program are the 365-mile Dempster Highway stretching from near Dawson in the Yukon to Arctic Red River in the Northwest Territories, from which point it is coincident, for a distance of

73 miles with the Mackenzie Highway to Inuvik, N.W.T. At the end of August, 1972, 166 miles of the Dempster Highway had been completed at a cost of \$6.7 million.

In keeping with the recent announcement to accelerate the construction of the Mackenzie Highway, a contract for \$2.3 million was awarded this year to build the section from Fort Simpson to Camsell Bend. The completion date for this 49-mile section of the Highway is October 31, 1973. This highway starts at mile 0 at the Alberta-N.W.T. border down the Mackenzie River Valley to Inuvik in the Mackenzie Delta, a distance of 964 miles, and terminates at Tuktoyaktuk on the Arctic coast for a total of 1,049 miles. Construction of the 296-mile section to Fort Simpson was completed in 1970.

b) Lateral Roads are those roads which lead from a communication and network road to a location where resource exploration, development and exploration is being carried out or may in the near future be carried out.

Lateral Roads are further broken down into two sub-categories, Cost-Sharing and Non-Cost-Sharing.

Cost-Sharing Roads, as the name implies, are those roads which are constructed by a resource developer but are financed jointly by the developer and the Government. Included in this sub-category are Tote Trails, Initial Access Roads and Permanent Access Roads.

Tote Trails are constructed by a resource developer and may receive a grant of up to 50% of their cost of construction to a maximum contribution of \$20,000. These provide seasonal or year-round access to the property of a company engaged in exploring or developing a natural resource. The Tote Trail Program is administered by the Commissioner of each Territory.

Initial Access Roads may receive the same maximum assistance grant as tote trails, but the maximum federal contribution will not exceed \$100,000 for projects of an exploratory nature or \$500,000 for projects in the development stage. This classification provides for contributions towards more costly roads than those provided for under tote trails. To date, \$428,427 has been spent on initial access roads in the Yukon Territory.

Permanent Access Roads lead from the nearest permanent road to the location of a resource development that has been brought into full production stage. These roads may receive a federal contribution of up to 2/3 of their cost but the maximum contribution may not exceed \$40,000 per mile.

Since 1966, \$1,880,747 has been spent on Permanent Access Roads constructed in the Yukon Territory, including an additional contribution of 2/3 of the cost of a bridge across the Pelly River to serve Anvil on the grounds that this bridge would also serve other interests.

Northern Resource Airports Program

The original program approval was by T. B. Minute North 647905, dated November 22, 1965. It is a cost-sharing scheme for constructing small airports to provide access to non-renewable resources, exploration and development sites, tourist development sites and to improve transportation facilities. They also serve as incentives to economic and social development.

Nature of Assistance

The policy refers to construction of airports in two categories. Under the first, Government assistance is available to defray 50% of the cost of an exploratory airport up to a maximum federal expenditure of \$20,000. For the second category, airstrips or airports built in connection with the pre-production or early production stage of natural resources exploitation, the Federal Government may contribute 50% of the cost up to a maximum of \$100,000 per airport. To March, 1973, 19 airstrips, at a cost of \$271, have been built under this Program.

Remote Airports Program

This program is people rather than resource oriented. The program is designed to provide small isolated communities, not warranting normal airports for scheduled airline services, with gravel all-weather airstrips, 3,300 feet in length capable of meeting the essential educational, health and emergency requirements of the community.

The program calls initially for the construction of 11 airports over an 8 to 10-year period at an estimated cost of \$6,167,000. The program calls for the Department to set the priorities for airport construction but the actual work will be done under Ministry of Transport supervision, with a view to adhering to standards that may permit ultimate airport licensing.

Since the inception of this Program in 1969, airports have been constructed at Coppermine, Pangnirtung in the Northwest Territories and Old Crow in the Yukon Territory, while construction continues at Fort McPherson, Whale Cove and Cape Dorset. Construction at the remaining communities of Eskimo Point, Aklavik, Chesterfield Inlet, Pond Inlet and Igloolik is scheduled to get underway in 1973-75.

Provision for Direct Financial Assistance

Northern Mineral Exploration Assistance Program

This program is designed to encourage mineral exploration activity in the Yukon Territory and Northwest Territories. Assistance in respect of one or more exploratory programs for a single applicant is limited in aggregate to \$50,000 but not exceeding 40 per cent of the approved cost of an exploration program. A total of 176 corporate applicants have applied for assistance in one or more programs of exploratory work.

Since the inception of the Program in 1967, \$3,613,773 has been paid in grants. Moreover, payments of \$9,022,500 have been made towards a large portion of oil and gas exploration in the Arctic Islands.

Prospectors' Assistance Program

In both the Yukon Territory and Northwest Territories, a combined amount of \$60,000 is available in the form of grants to aid prospectors in their search for mineral deposits. A prospector may receive up to \$900 each year to help finance his prospecting venture. The program has been well received since its introduction in 1962 and was instrumental in the location of several mineral discoveries.

During 1972, the entire amount was committed. Forty-one prospectors in the Northwest Territories and 62 in the Yukon Territory participated in the program.

Assay Service

There were approximately 1,797 assays performed during 1972 at the Government Assay Office at Yellowknife at a value of \$8,996.

In the Yukon Territory, 50 per cent of the cost of 10 assays per prospector per year is paid by the Federal Government. During 1972, approximately 266 assays were paid for at a cost of \$2,105 to the Federal Government.



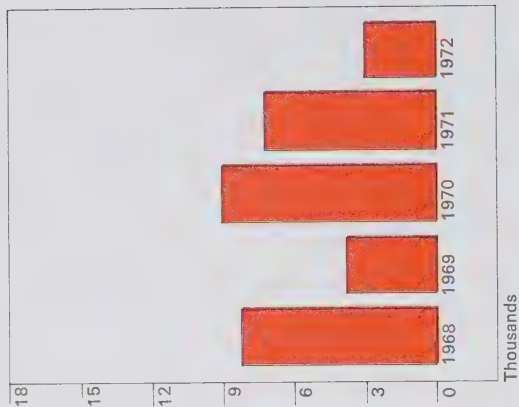
Causes of Disabling Injuries in Mines

	Drilling	Caught between two objects	Strain while lifting	Fall of persons	Struck by moving object	Foreign matter in eyes	Tramming cars	Gassing	Fall of rock	Falling object	Blasting	Burns	Miscellaneous	Total
Northwest Territories														
Arvik Mines Ltd.														0
Canada Tungsten Mining Corp. Ltd.		1		1	1							1	1	5
Con-Rycon-Vol			1	1	1				1					4
Echo Bay Mines Ltd.		5	3	5	2	2	1		9	1		1	1	30
Giant Yellowknife Mines Ltd.		3	1	2	3	1	1		2				2	15
Pine Point Mines Ltd.		1		1										2
Terra Mining and Exploration Ltd.			1	2		1			1					5
Total		10	6	12	7	4	2		13	1		2	4	61
Yukon Territory														
Anvil Mining Corp.		2	5	6	3				1			2	7	26
Cassiar Asbestos Corp.													2	2
Hudson-Yukon Mining Co. Ltd.		2		3						1			2	8
Whitehorse Copper Mines Ltd.		3	4	7	4	1			2				5	26
United Keno Hill Mines Ltd.			3	6	3				3				1	16
Tantalus Butte Mine			1						1					2
Total		7	13	22	10	1			7	1		2	17	80

Mining Accident Severities

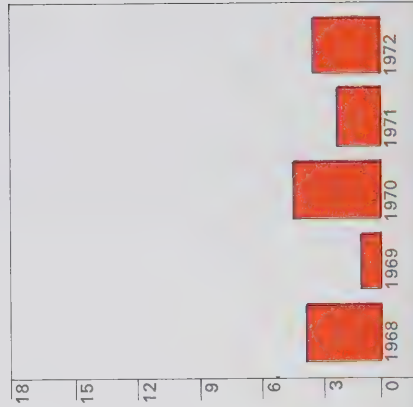
Northwest Territories

Mine	Number of Man-hours Worked 1972	Number of Days lost Jan-Dec. 1972	Accident Severity Jan-Dec. 1972	Accident Severity Jan-Dec. 1971
Arvik Mines Ltd.	34,595			
Canada Tungsten Mining Corp. Ltd.	210,481	115	546	1,046
Con-Rycon-Vol	419,936	896	2,134	1,739
Echo Bay Mines Ltd.	385,627	256	664	22,430
Giant Yellowknife Mines Ltd.	784,028	7,341	9,363	27
Pine Point Mines Ltd.	1,095,405	148	135	5,864
Terra Mining and Exploration Ltd.	93,773	104	1,110	38,028
Total	3,023,845	8,860	2,930	6,670



Yukon Territory

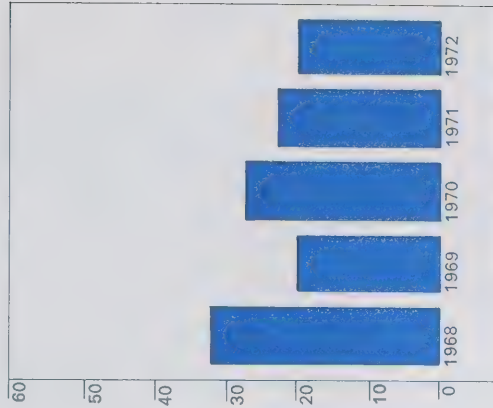
Mine	Number of Man-hours Worked 1972	Number of Days lost Jan-Dec. 1972	Accident Severity Jan-Dec. 1972	Accident Severity Jan-Dec. 1971
Anvil Mining Corp.	729,014	390	535	272
Cassiar Asbestos Corp.	761,830	116	152	596
Hudson-Yukon Mining Co. Ltd.	218,229	6,111	28,003	3,815
Whitehorse Copper Mines Ltd.	274,764	548	1,994	2,555
United Keno Hill Mines Ltd.	534,986	1,017	1,900	1,870
Tantalus Butte Mine	28,015	11	393	1,999



Mining Accident Frequencies

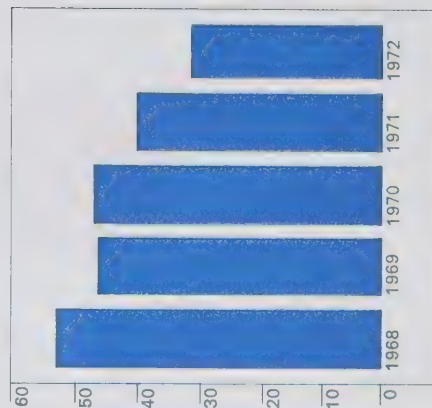
Northwest Territories

Mine	Number of Man-hours Worked 1972	Number of Accidents Jan-Dec. 1972	Accident Frequency Jan-Dec. 1972	Accident Frequency Jan-Dec. 1971
Arvik Mines Ltd.	34,595			
Canada Tungsten Mining Corp. Ltd.	210,481	5	23.75	39.23
Con-Rycon-Vol	419,936	4	9.52	19.81
Echo Bay Mines Ltd.	385,627	30	77.79	103.72
Giant Yellowknife Mines Ltd.	784,028	15	19.13	1.25
Pine Point Mines Ltd.	1,095,405	2	1.82	3.84
Terra Mining and Exploration Ltd.	93,773	5	53.32	89.28
Total	3,023,845	61	20.17	22.58

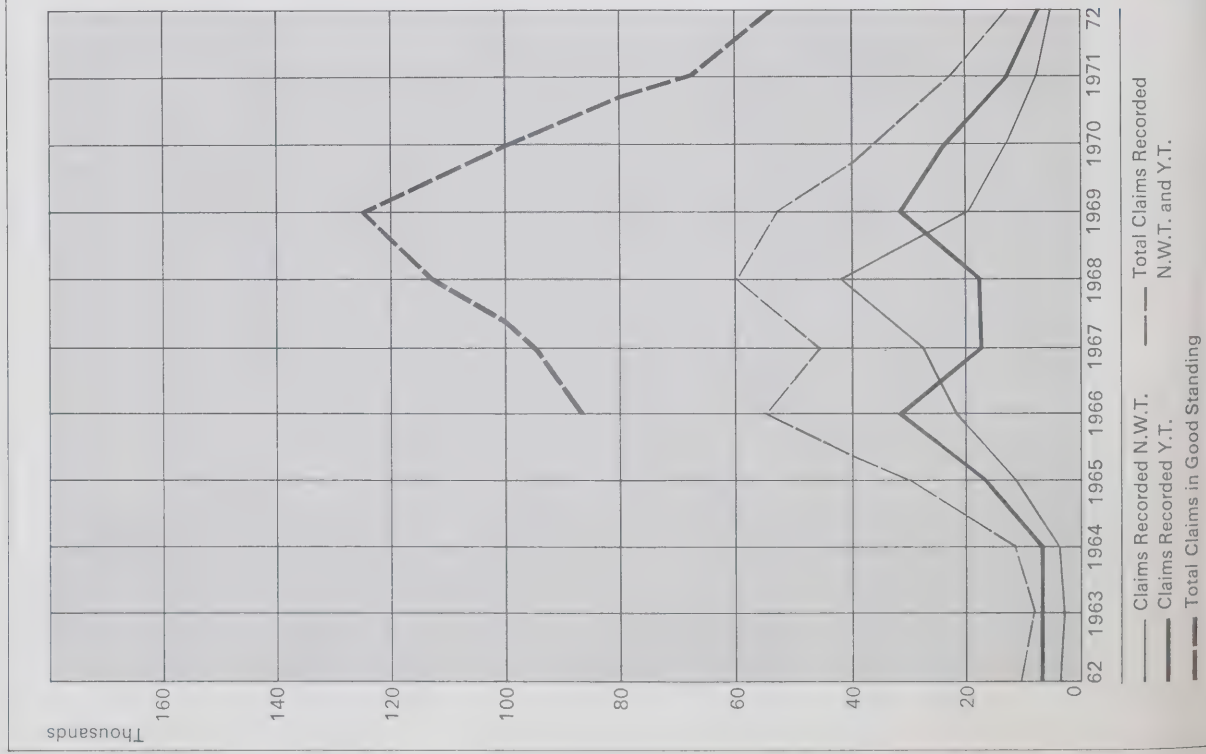


Yukon Territory

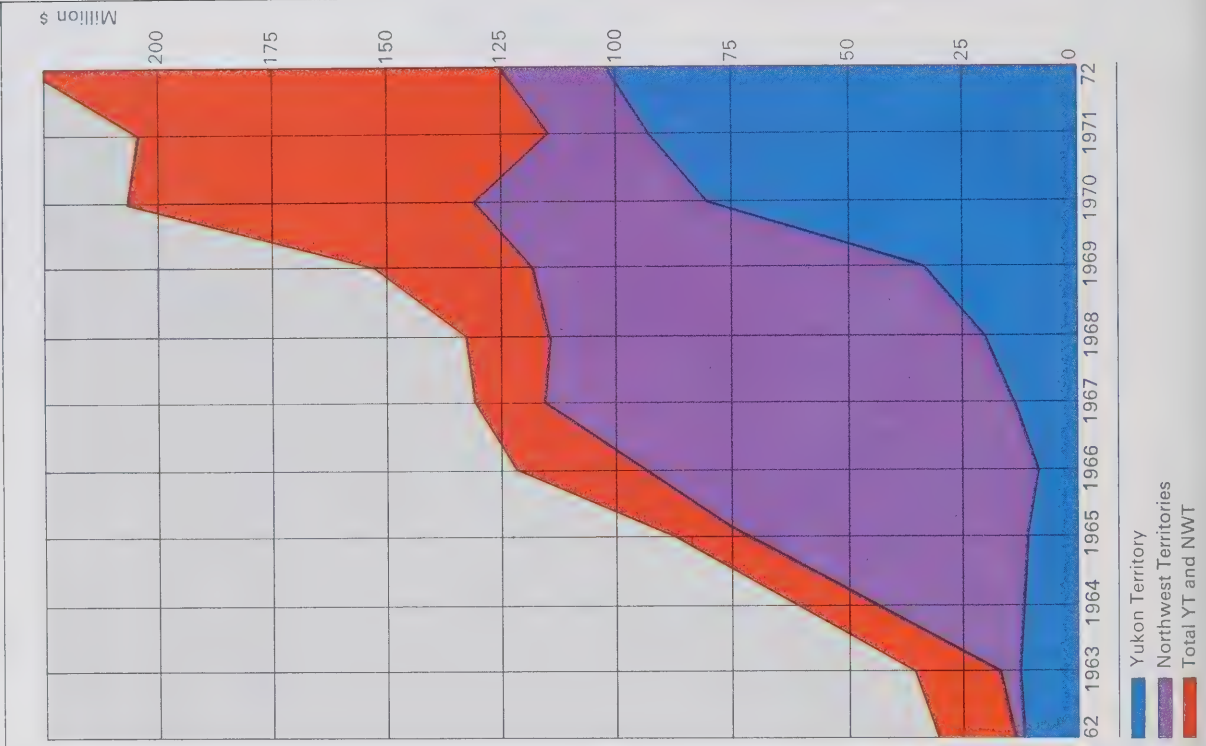
Mine	Number of Man-hours Worked 1972	Number of Accidents Jan-Dec. 1972	Accident Frequency Jan-Dec. 1972	Accident Frequency Jan-Dec. 1971
Anvil Mining Corp.	729,014	26	35.66	29.58
Cassiar Asbestos Corp.	761,830	2	2.62	2.60
Hudson-Yukon Mining Co. Ltd.	218,229	8	36.65	135.10
Whitehorse Copper Mines Ltd.	274,764	26	94.62	89.69
United Keno Hill Mines Ltd.	534,986	16	29.90	31.08
Tantalus Butte Mine	28,015	2	71.39	124.91
Total	2,546,838	80	31.41	39.80



Mineral Claims Recorded



Value of Production



Mineral Production Chart 1963 to 1972

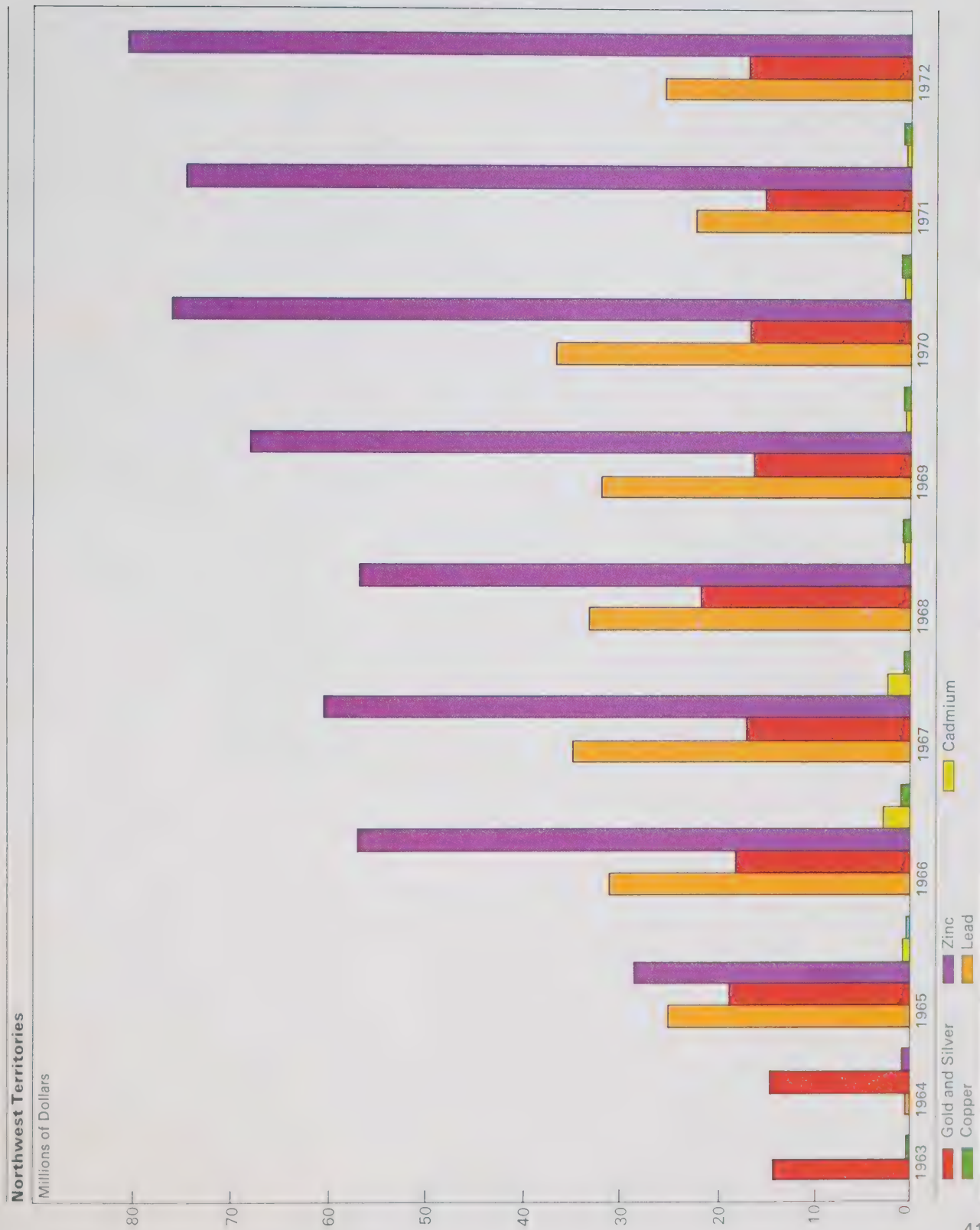
Northwest Territories											
Mineral	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972(a)	Cumulative Totals(b)
Gold	\$ 14,609,250 ozs. 387,000	15,586,182 412,879	17,071,580 452,479	15,990,133 424,029	14,356,476 380,304	13,285,459 352,306	12,381,240 328,502	12,168,776 332,844	10,897,934 308,339	10,537,000 288,000	312,757,163
Silver	\$ 107,216 ozs. 77,468	91,312 65,223	1,490,754 1,064,824	2,325,407 1,662,192	3,429,755 1,980,228	8,677,365 3,751,563	3,910,888 2,026,367	5,114,587 2,764,642	4,574,616 2,932,446	7,303,000 4,399,000	38,768,844
Copper	\$ 10,281 lbs. 32,638		354,342 942,400	672,065 1,495,805	538,077 1,131,126	833,169 1,732,160	643,761 1,251,723	766,578 1,320,502	727,595 1,378,021	609,000 1,204,000	6,570,536
Nickel	\$										12,850,205
Lead	\$	823,279 lbs. 6,125,588	25,677,695 165,662,547	31,472,562 210,659,720	35,665,535 254,753,820	33,636,984 250,275,180	32,299,014 212,913,740	37,842,405 239,206,099	22,629,795 167,628,110	25,606,000 166,000,000	245,652,269
Zinc	\$	1,111,016 lbs. 7,840,620	28,596,474 189,380,626	57,128,344 378,333,400	60,852,900 419,964,800	57,504,129 407,830,700	68,275,481 448,296,000	76,004,563 477,115,900	75,056,384 448,633,500	80,094,000 420,000,000	504,623,291
Pitchblende (d)	\$										79,477,897
Cadmium	\$		516,635 lbs. 185,840	2,769,372 1,073,400	2,551,920 911,400	774,060 271,600	675,136 191,800	737,632 207,200	301,476 155,400		8,326,231
Bismuth	\$							3,072 490	41,149 7,578		44,221
Tungsten	\$								3,288,400	3,100,000	
Total	\$	14,726,747	17,611,789	73,707,480	117,394,663	114,711,166	118,185,520	132,637,613	114,228,949	124,149,000	1,209,071,657
(c)											
Yukon Territory											
Gold	\$ 2,084,215 ozs. 55,211	2,183,611 57,844	1,698,975 45,031	1,639,103 43,466	675,725 17,900	911,338 24,167	1,118,715 29,682	653,034 17,862	511,534 14,473	146,000 4,000	268,429,370
Silver	\$ 8,450,755 ozs. 6,106,037	7,894,196 5,638,712	6,462,393 4,615,995	5,868,217 4,194,580	6,701,756 3,869,374	4,806,384 2,077,987	5,182,166 2,685,060	7,845,312 4,240,709	8,966,417 5,747,703	9,330,000 5,620,000	164,378,659
Lead	\$ 1,867,647 lbs. 16,978,607	2,744,235 20,418,415	2,766,953 17,851,309	2,386,684 15,975,125	2,141,959 15,299,709	970,629 7,221,940	4,256,183 28,056,581	20,830,196 131,670,010	29,340,379 217,336,142	34,848,000 225,921,000	145,571,577
Copper	\$				3,409,779	5,097,157	7,645,623	9,148,995	2,709,696		31,113,033
Coal	\$ 123,675 tons 8,231	98,150 7,229	85,626 8,801	46,390 5,670	15,791 1,912	10,908	6,039	10,908	21,026	18,435	2,567,132
Zinc	\$ 1,514,520 lbs. 11,850,706	1,855,512 13,094,653	2,000,396 13,247,653	1,729,027 11,450,510	1,373,151 9,476,545	748,206 5,306,429	5,035,385 33,062,280	24,845,216 155,964,948	39,003,34 233,134,144	43,861,000 230,000,000	147,230,567
Cadmium	\$ 326,124 lbs. 135,885	428,399 132,222	386,192 138,918	306,336 118,735	265,997 94,999	147,716 51,830	239,965 68,172	261,528 73,463	114,654 59,100	33,000 13,000	6,248,758
Asbestos	\$				406,371	8,684,125	11,924,526	13,927,652	12,374,380	14,200,000	61,517,054
Total	\$	14,366,936	15,204,103	13,400,535	11,975,757	14,990,529	21,365,555	77,511,933	93,020,402	102,418,000	827,056,150

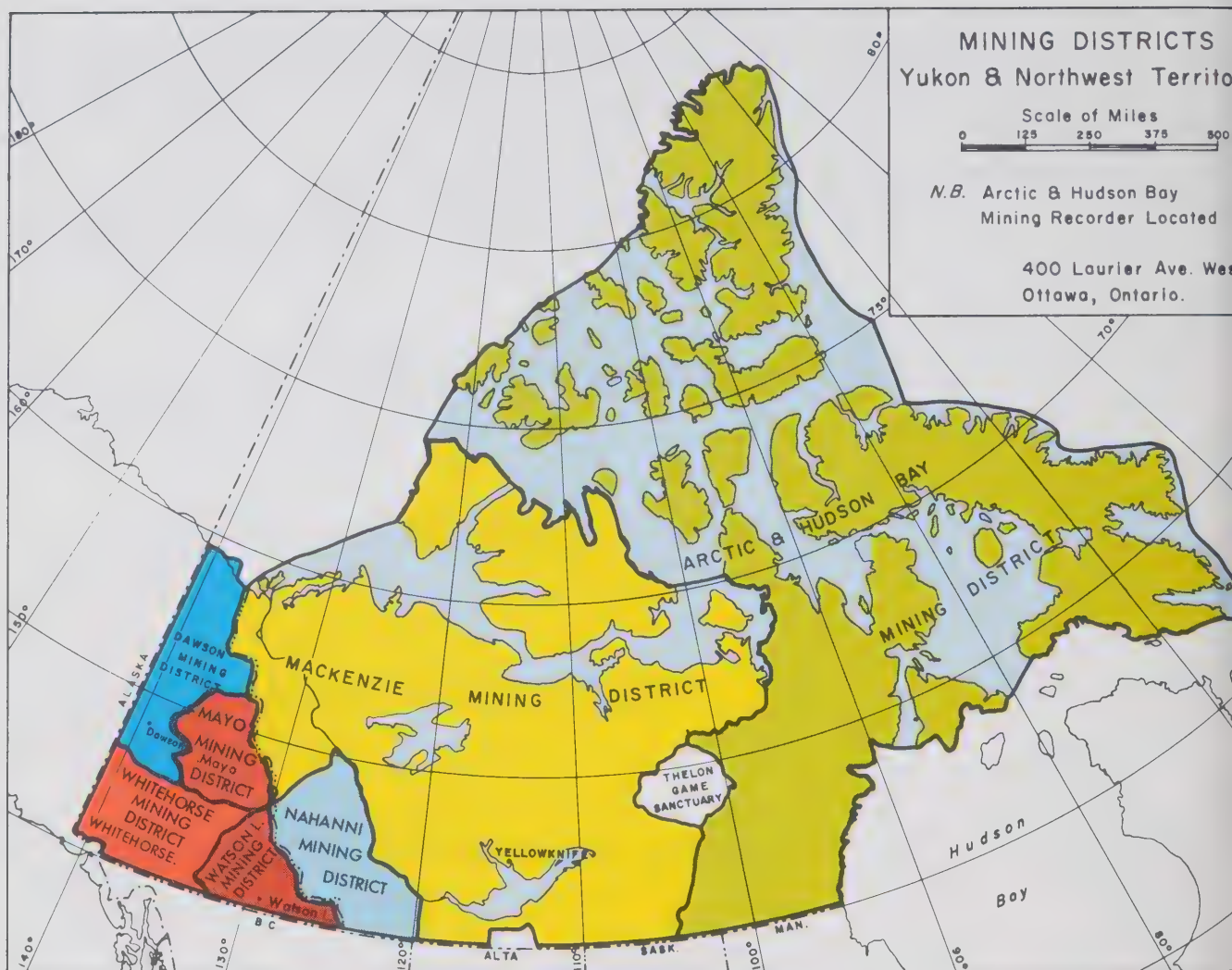
(a) Preliminary Figures (b) Cumulative Totals—1932 to December 31, 1972 (Figures for tungsten not available)
(c) Cumulative Totals—1886 to December 31, 1972 (d) Figures for years 1932, 1943, to 1953 not available.

Value of Mineral Production



Value of Mineral Production





The following contributed to the illustrations in this publication:

Trans North Turbo Air Limited (1971)

Ptarmigan Airways Limited

Cominco Limited

Wardair Canada Limited

National Museum

Roy Minter, Vice-President, White Pass and Yukon Route

Pacific Western Airlines

Kenting Air Sciences



Indian and
Northern Affairs

Affaires indiennes
et du Nord

North of 60

Mines and Minerals
Activities 1973



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- M35

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North of 60

**Mines and Minerals
Activities 1973**

*Canada. Dept. of Indian Affairs
and Northern Development.*

Mining Section, Oil and Mineral Division
Northern Natural Resources and Environment Branch
Department of Indian and Northern Affairs

Issued under the authority of the
Hon. Jean Chrétien, PC, MP, Minister of
Indian and Northern Affairs



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Introduction

In the Yukon, the value of production in 1973 was \$145,594,000 while in the Northwest Territories it was \$164,700,000, an increase of 37 per cent and 40 per cent respectively over the 1972 figures. Proven reserves of mineral wealth in Canada's North continue to mount as a result of the increased exploration activity that has taken place in recent years.

Some highlights are:

In the Yukon, United Keno Exploration, Silver Standard Mines and American Smelting and Refining Company found a large deposit of good grade copper 150 miles northwest of Whitehorse.

Barrier Reef Resources Limited has made an important find of zinc mineralization associated with a sedimentary rock formation at Goz Lake, 115 miles northeast of Mayo.

A test shipment of 3,700 tons of lead-zinc ore was made from Little Cornwallis Island in the Canadian Arctic by Arvik Mines Limited. The Company is preparing a feasibility study for their large deposit.

Mineral Resources International completed a feasibility study of the Strathcona Sound lead-zinc deposit, and are planning to bring its property into production.

Cominco began sinking a 5,600-foot shaft on its Con-Rycon gold property at Yellowknife.

Claim staking in 1973 in the Canadian North increased 99 per cent over 1972; 9,383 claims in the Yukon and 15,303 claims in the Northwest Territories were staked compared to 6,845 and 5,555 respectively in 1972.

Diamond drill core storage libraries were opened in December 1973 in Whitehorse, Yukon Territory, and Yellowknife, Northwest Territories, and were designated respectively the H.S. Bostock and C.S. Lord Libraries after two eminent geologists recently retired from the Geological Survey of Canada.

Rising world gold prices have revived interest in the placer gold fields of the Klondike and lode deposits in all gold districts in the Northwest Territories.

Exploration activity ranged over a wide area of the Canadian North, including Ennadai Lake, Rankin Inlet, Baker Lake, Northern Baffin Island and Ellesmere Island.

Canada Tungsten Mining Corporation Limited will begin production in 1974 from its new tungsten underground mine deposit adjacent to its present open pit mine.

O'Brien Gold Mines will carry out underground exploration in 1974 on a gold showing in the Cullaton Lake area of the N.W.T.

Numbers in parentheses throughout the book refer to location of activity areas on the accompanying mineral exploration and mining map.

Mining Geophysics Aid Northern Development

Each year, more and more of Canada's vast northern territories are being explored in the search for minerals, spurred by world demands for depleting ore reserves. Many mineralized areas exposed at surface have been found and exploration has entered a stage where deposits now being found are usually concealed beneath overburden and rock talus, necessitating the use of geophysical methods for detecting the buried mineralization.

Geophysical methods have already detected hidden deposits of mineralization as demonstrated in the Pine Point area of the Northwest Territories, where ground induced polarization surveys outlined important deposits of lead-zinc mineralization. Similarly, Anvil's Faro ore body in the Yukon was originally detected in 1965 by using aerial magnetic and electro-magnetic surveys, followed by geochemical techniques. Thus, northern Canada's two largest and richest mines were discovered through the use of geophysical methods.

Mining geophysics could be said to date from the year 1600 when Sir William Gilbert discovered that the earth was a huge magnet. Since then, the various methods used in geophysics have evolved:

1. Magnetic; in the early 1600's magnetic bars and dip needles were used in Sweden to prospect for magnetic iron deposits.
2. Seismic; in 1761, John Mitchell suggested the use of time measurements of shock waves from different stations to determine the location of earthquakes although the Chinese had used crude instruments to measure direction and intensity of earthquakes 20 centuries ago.
3. Gravitational; first measured by Cavendish in the late 18th century; field measurements became possible with Von Eotvos' torsion balance in 1889.
4. Electrical; in 1835 Robert W. Fox discovered a copper sulphide body using spontaneous polarization. Fox also suggested the use of electrical resistance to study sub-surface geological formations.
5. Radiometric; in the early 20th century the discovery of the Geiger tube by Geiger, an associate of Sir Earnest Rutherford, made possible the development of field instruments for the measurement of radioactivity.

Geophysical surveys were originally all conducted on the ground, but with the development of aircraft and specialized equipment, airborne surveys became widely accepted, especially for reconnaissance type work.

The start of modern exploration geophysics in northern Canada may be traced back to 1944, when Dr. A.W. Jolliffe of the Geological Survey of Canada carried out a search for uranium in the Great Bear Lake area, using Geiger counters provided by the National Research Council. From this evolved the modern lightweight Geiger counters used by prospectors today.

The Department of Energy, Mines and Resources led the way in airborne geophysics in Canada when, in 1947, started carrying out surveys and publishing aeromagnetic maps of the country. Most of this work has been carried out jointly by federal and provincial departments, with results being published at a scale of one inch to one mile. The Department of Energy, Mines and Resources has continued this program in the Yukon and Northwest Territories, and each year new maps are published. One example of mineral detection using this method of geophysics is the discovery of a large low-grade magnetic iron deposit at Ege Bay on Central Baffin Island.

The Department of Energy, Mines and Resources has also been carrying out systematic gravity surveys throughout Canada, including the North. Gamma ray spectrometry investigations and color aerial photography have been carried out in the N.W.T. Although these surveys are not aimed at the detection of ore bodies, they, like the aeromagnetic work, provide fundamental information on the nature, composition and structure of the earth's sub-surface.

In the private sector only the major mining companies have been able to provide the special instrumentation and related technology needed to carry out large expensive surveys. The need for similar services to satisfy the demands of the smaller companies has led to the development of the geophysical survey industry in Canada. Canadian companies are developing techniques and manufacturing geophysical instruments which are being used in many other countries. One of the newest and most sensitive systems being developed utilizes the biogeochemical AIRTRACE® developed by Barringer.

Canada has all the technical know-how to develop its northern mineral resources. With world demands for these resources continually growing, the geophysical industry will be playing an even greater role in the orderly development of our northern territories.

*Historical data obtained from *Prospecting in Canada and Mining Geophysics*, 6th Commonwealth Mining and Metallurgical Congress

Geological Survey of Canada uses the Sky Van (foreground) for gamma-ray spectrometry investigations and the Beech Queen Air equipped with a high sensitivity magnetometer.





Yukon Territory

Producing Mines

Six mines operated in the Yukon during 1973; four underground and two open pit mines. One mine was closed during the year. Production included lead, zinc, silver, cadmium, nickel, copper, platinum, asbestos and coal. Lead and zinc accounted for 67 per cent of the total production. Value of mineral production from the Yukon at \$145,594,000 in 1973 was up 37 per cent over the 1972 production. The Yukon was the number one producer of Canadian lead.

Lead-Zinc-Silver

Anvil Mining Corporation Ltd. operates a large lead-zinc open pit mine in the Ross River area, 130 air miles northeast of Whitehorse. It is the largest producer in the Yukon. Production remained at 7,940 tons per day, but this is expected to increase substantially in 1974. The company has 375 employees.

Anvil Mining Corporation

Type	Open Pit
Location:	130 miles northeast of Whitehorse
Product:	lead, zinc, silver, gold
Rate:	7,942 tons per day
Total Tons Milled:	2,899,124
Reserve Grade:	11.7 per cent combined lead-zinc, 1 ounce silver per ton
Reserves:	59,940,000 tons
Employees:	375

Asbestos

Cassiar Asbestos Corporation Ltd. operating an open pit asbestos mine at Clinton Creek, 50 miles northeast of Dawson City, produced at a rate of 4,838 tons per day. This mine had an average of 228 employees during the year. Fibre is transported by road to Whitehorse, then railway to Skagway, Alaska, for onward shipment to world markets.

Cassiar Asbestos Corporation Ltd.

Type	Open Pit
Location:	50 miles northwest of Dawson City
Product:	asbestos fibre
Rate:	4,838 tons of ore per day
Total Tons Milled:	1,247,154
Reserve Grade:	5.37 per cent fibre
Reserves:	18,750,000 tons
Employees:	228

Silver-Lead-Zinc-Cadmium

United Keno Hill Mines Ltd. increased its milling rate from 220 tons per day in 1972 to 256 tons per day in 1973. Value of production increased substantially, mainly because of the increase in price of silver and zinc. The company had an average of 280 employees during 1973.

United Keno Hill Mines Ltd.

Type	Underground
Location:	31 miles northeast of Mayo
Product:	silver, lead, zinc, cadmium
Rate:	256 tons per day
Total Tons Milled:	95,179
Reserve Grade:	56.8 ounces/ton silver, 6.4 per cent lead, 1.5 per cent zinc
Reserves:	65,000 tons (56.8 ounces of silver per ton; 6.4 per cent lead; 1.5 per cent zinc) plus 26,000 tons at 40 ounces silver per ton.
Employees:	280

Copper

Whitehorse Copper Mines Ltd., which started production from underground in December, 1972, produced at a rate of 1,919 tons per day in 1973. Total work force throughout the year averaged 196 persons.

Whitehorse Copper Mines Ltd.

Type	Underground
Location:	7 miles south of Whitehorse
Product:	copper, silver, gold
Rate:	1,919 tons of ore per day
Total Tons Milled:	700,054
Reserve Grade:	2.38 per cent copper
Reserves:	3,000,000 tons of 2.38 per cent copper
Employees:	196

Nickel-Copper

Hudson-Yukon Mines Ltd. operated the Wellgreen nickel-copper property situated at Mile 1111 on the Alaska Highway at a rate of 460 tons per day until August 1973. The mine was shut down due to lack of continuity in the ore body and poor ground conditions. The mine operated for about a year and a half from May 1972. Average number of employees on the payroll was 57.

Wellgreen Mine

Type	Underground
Location:	Quill Creek, Y.T.
Product:	nickel, copper
Rate:	459 tons per day
Total Tons Milled:	76,760
Reserve Grade:	2.04 per cent nickel; 1.42 per cent copper; 0.065 ounces per ton platinum metals; 0.073 per cent cobalt
Reserves:	not available
Employees:	57

Coal

Tantalus Butte Coal Mine, operated by Anvil Mining Corporation Ltd., continued mining coal throughout the year at 80 tons per day, with a total work force of 19. The coal is shipped to the Anvil Mine and is used for drying lead-zinc concentrates.

Tantalus Butte Coal Mine

Type	Underground
Location:	Carmacks, Y.T.
Product:	coal
Rate:	78 tons per day
Total Tons Mined:	19,601
Reserve Grade:	thermal coal
Employees:	19

Developing Properties**Tungsten**

Amax Corporation, Inc. (3) has completed an underground exploration program on its Macmillan Pass (105 N 8, 63° 17' N, 130° 05' W) tungsten property in the area of the Yukon-N.W.T. border. Preliminary reserves amount to 30 million tons of 0.9 per cent tungsten trioxide.

Bulk samples consisting of 250 tons of crushed and 75 tons of uncrushed material were shipped to the parent company, American Metal Climax, Colorado. Underground workings completed in 1973 consist of a 1,450-foot adit directed north 60° west for 1,150 feet and west for the remainder. Four crosscuts were driven through the mineralized zone and 5,400 feet of underground diamond drilling was completed.

Copper

BX Development (4) has announced that Dawson Range Joint Venture has further evaluated its Williams Creek property, 30 miles northwest of Carmacks, and has reported a significant tonnage of one per cent copper plus minor values in precious and other metals. A preliminary production feasibility study and detailed metallurgical tests will be included in the next level of work.

Mineral Exploration**Copper**

Whitehorse Copper Mines Limited (12) continued exploratory drilling on its Whitehorse Copper Belt property in September in an effort to increase reserves. By the end of October, five holes, total footage 2,100 feet, were drilled on the Middle Chief (105D11, 60° 35' N, 135° 04' W) and Cowley Park (105 D 11, 60° 35' N, 134° 53' W) mineralized zones. Drilling on the Black Cub South (105 D 11, 60° 35' N, 134° 57' W) and Valerie (105 D 11, 60° 38' N, 135° 04' W) proceeded during November. Ore bodies in the Whitehorse Copper Belt consist essentially of bornite and chalcopyrite in skarn zones developed in limestone adjacent to diorite-granodiorite intrusions of the Coast Range suite.

Hudson Bay Exploration and Development Company Limited (12) continued exploration in the Copper Belt under its agreement with Whitehorse Copper Mines Limited. Early in 1973 the company completed a drilling program on the historic Pueblo Mine site (105 D 11, 60° 44' N, 135° 07' W) and in June drilled beneath the Grafter open pit (105 D 11, 60° 35' N, 134° 57' W) near the south end of the Copper Belt.

United Keno Exploration, a consortium representing *Canadian Superior Exploration Limited*, *Falconbridge Nickel Mines Limited* and *United Keno Hill Mines Limited* (5) made a significant copper discovery on its DEF claim group (115 I 11, 62° 38' N, 137° 17' W) 10 miles west of Minto. Following detailed soil sampling and bulldozer trenching in 1972, a drilling program was completed between May and October of 1973 consisting of a total footage of 25,000 feet in 46 holes. Host rock is biotite-hornblende granodiorite. Mineralization consists of bornite and chalcopyrite as disseminated blebs in gneissic, biotite-rich, essentially flat lying (locally) zones within the granodiorite. The mineralized zone extends into the Minto property immediately to the south, owned jointly by ASARCO and Silver Standard.

Silver Standard Mines Limited-ASARCO (5) resumed drilling on their Minto property (115 I 11, 62° 36'N, 137° 17'W) in August, directly south of the United Keno Exploration discovery. The 1973 drilling was completed in early November with 59 holes having a total footage of 16,500 feet. As on the DEF property, bornite and chalcopyrite are present in a biotite-rich, gneissic granodiorite. Reserves on the two properties, on the basis of exploration to date, are estimated to exceed six million tons, with a grade between two and three per cent copper, including minor values in gold and silver.

Northair Mines Limited (5) did geological mapping and soil geochemical sampling on the ROD claims (115 I 11, 62° 40'N, 137° 09'W) in 1973. The claims are four miles northeast of the United Keno copper discovery.

Yukon Gold Placers Limited (5) and *Pinnacle Mines Limited* own the COMANCHE claim group, which adjoins the west boundary of the MINTO property. The 1973 exploration consisted of soil sampling and geological mapping.

Taseko Mines Limited (5) hold the COIN claims, five miles east of the United Keno discovery. In 1972 some bulldozer trenching was done on the COIN claims. The 1973 work consisted of a soil geochemical survey and geological mapping. The main showing on the claims, first discovered in 1902, consists of disseminated bornite in amphibolitized volcanics adjacent to a monzonite intrusion, (115 I 11, 62° 38'N, 137° 07'W).

Silver City Mines Limited (13) experienced several delays in carrying out its program of underground exploration on the White River property (115 F 15, 61° 47'N, 140° 48'W). The adit, at the 2,800-foot elevation, was designed to further test a mineralized zone present on the 2,900-foot level. The adit was driven 410 feet, with work ceasing in late October. Thin stringers and veinlets of chalcocite in sheared, amygdaloidal volcanics are present at the adit face.

Jack Pot Copper Mines Limited (14) resumed exploration on the company property (115 A 3, 60° 03'N, 137° 08'W) on the Tatshenshini River south of Dalton Post, near the Yukon-B.C. boundary. The property has been inactive during the previous two years. An I.P. survey was conducted, and 1,200 feet were drilled on I.P. anomalies. Earlier work had explored a rusty shear zone containing chalcopyrite on a contact between a granitic intrusive and schistose andesite.

Copper-Molybdenum

Casino Silver Mines Limited (15) renewed activity on its property in the Dawson Range (115 J 10, 15, 62° 43'N, 138° 49'W), which had been inactive since 1971. Starting in mid-August the company drilled seven holes totalling roughly 5,000 feet of core. The program was directed primarily towards further delineating a mineralized zone discovered during the 1969-71 field seasons.

Cyprus Exploration Corporation (16) continued exploration on the Mount Nansen property (115 I 3, 62° 03'N, 137° 08'W). The property, which produced from gold-silver veins in late 1968 and early 1969, is currently being assessed as a possible porphyry copper-molybdenum deposit. The 1973 work consisted of 2,000 feet of diamond drilling in three holes, positioned on the basis of the 1972 geophysical work.

Canadian Occidental Petroleum Limited (17) carried out geological mapping and soil sampling on its THATCH and HATCH (115 H 13, 61° 35'N, 137° 40'W) groups west of the north end of Aishihik Lake. Bedrock geology consists of Nisling Range granitic rocks in contact with Yukon Group metasediments.

Copper-Nickel

J. S. Vincent Limited (18) did detailed geological mapping of the SPY claim group (115 G 2, 61° 09'N, 138° 45'W) west of Kluane Lake, following preliminary geological and geochemical surveys in 1972. Chalcopyrite and nickeliferous pyrrhotite occur as disseminations near the base of a gabbro-peridotite intrusion.

J. S. Vincent Limited (13) renewed activity in 1972 on the earlier explored Canalask Nickel Mines property on the White River (115 F 15 and 16, 61° 57'N, 140° 32'W), with detailed magnetometer and E.M. surveys and geological mapping. In 1973, six holes totalling 2,500 feet were drilled to test magnetic anomalies in the peridotite.

Lead-Zinc-Silver

Canex Placer Limited (7) undertook an extensive exploration program on its Nahanni lead-zinc prospect near Summit Lake (105 I 6, 11 and 12, 62° 28'N, 129° 13'W). Following the discovery of galena-sphalerite showings late in the 1972 exploration season (a follow-up of earlier geochemical surveys), a major staking rush took place in the area. During 1973 Canex Placer drilled 15,000 feet in 26 holes and did extensive bulldozer trenching and detailed geological mapping. The belt staked by Canex, one to three miles wide and some 25 miles long, is underlain by argillaceous sediments of Cambrian to Devonian-Mississippian age. The galena and sphalerite is fine-grained and largely confined to a cherty shale zone approximately 200 feet above the upper contact of an Ordovician limestone. High grade lenses in a calcareous facies contain up to 40 per cent combined lead and zinc.

Vestor Exploration Limited (7) carried out a program of geological mapping and soil and rock sampling on its UN, NOR, PEL, TROIS, DI, CINE, LUCK, AXE, TIN, GAP, PAL and OK claim groups in the Summit Lake area (105 I 6, 11 and 12, 62° 30'N, 129° 30'W). Several anomalies were recognized.

Dynasty Explorations Limited (7) did geological mapping and soil sampling on the PREVO, PAS, GULL, DEA, TAM and DYN groups in the Summit Lake area (105 I 6, 11 and 12, 62° 30'N, 129° 30'W). Results on the GULL and PAS groups located lead-zinc and copper-lead-zinc anomalies in black shales.

Noranda Exploration Company Limited (7) did geological mapping on the NESS, MAD, ORO and RAY groups near Summit Lake (105 I 6, 11 and 12, 62° 30'N, 129° 30'W). In September of 1973 the company did a small amount of diamond drilling to test a barite showing on the ORO group (105 I 12, 62° 38'N, 129° 45'W).

Cominco Limited (7) hold the CMC and BEV claim groups in the Summit Lake area (105 I 6 and 12, 62° 30'N, 129° 30'W). The 1973 work consisted of geological mapping and soil sampling.

Dassan Copper Corporation Limited (7) conducted geological and geochemical surveys on its LAD, NAH and BYL claims near Summit Lake (106 I 6, 11 and 12, 62° 30'N, 129° 30'W).

Cream Silver Mines Limited (7) carried out geological mapping, rock geochemistry and soil sampling on its ROSS and NOR claims near Summit Lake (105 I 6, 11 and 12, 62° 30'N, 129° 30'W).

Acheron Mines Limited (7) hold the GNVI claim group (105 I 11, 62° 30'N, 129° 15'W) near Summit Lake. The company did geological mapping and soil and rock geochemistry on this property in 1973.

Belmoral Mines Limited (7) did geological mapping and soil and rock geochemistry on its portion of the CWT claim group in the Summit Lake area. (105 I 6, 62° 28'N, 129° 08'W).

Skyline Explorations Limited (7) conducted geological mapping and soil sampling on the REN, TON and NOD claims in the Summit Lake area (105 I 6 and 11, 62° 30'N, 129° 15'W) during late August and early September.

Teck Corporation Limited (7) did geological mapping, prospecting and soil sampling during the summer field season on the ORE and PRO claims in the Summit Lake area. (105 I 6, 62° 20'N, 129° 25'W).

Black Giant Mines Limited (7) conducted soil sampling on its LAD claims, Summit Lake area (105 I 12, 62° 40'N, 129° 53'W).

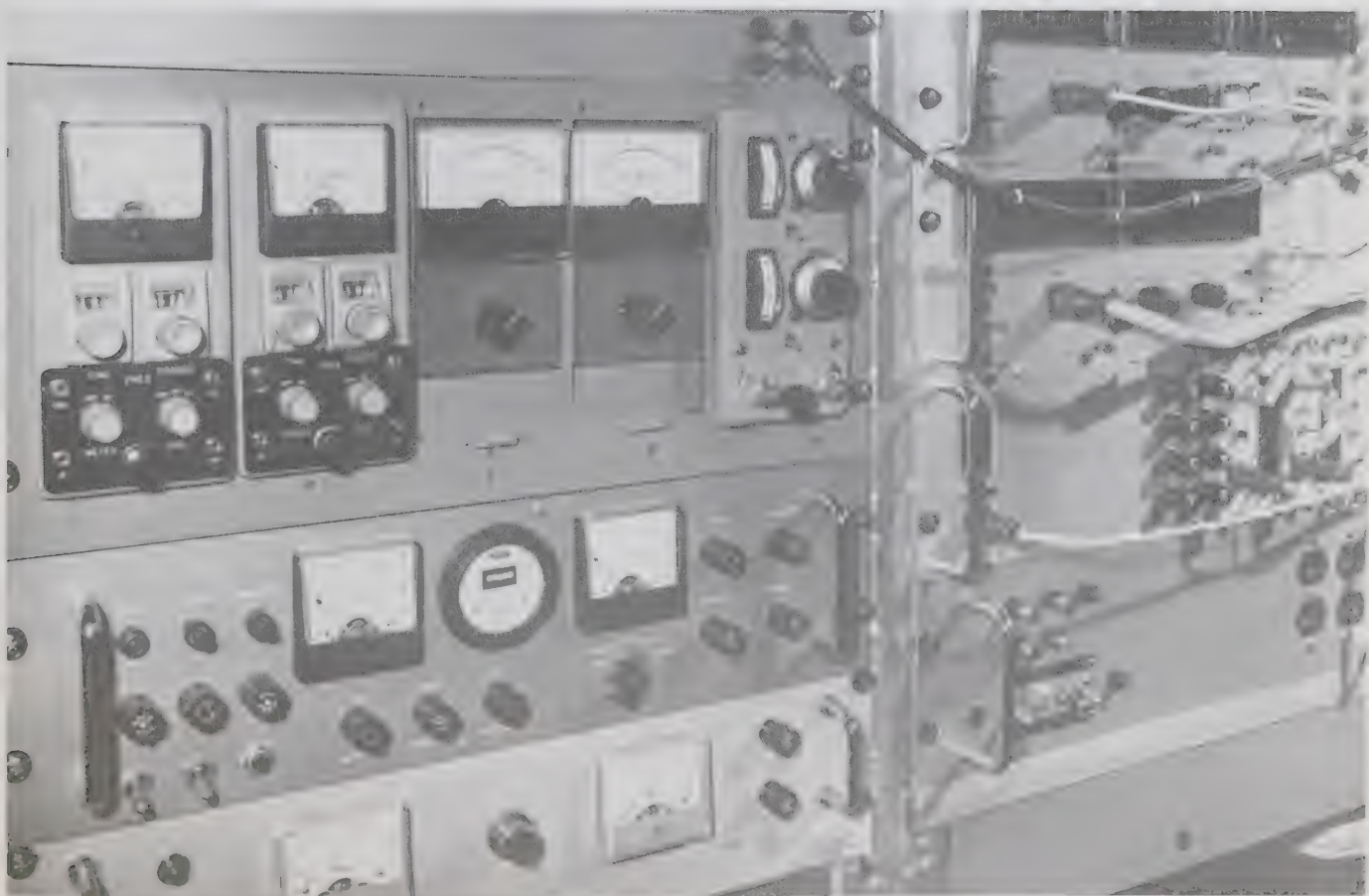
Tay River Mines Limited (7) holds the NAT claims in the Summit Lake area (105 I 12, 62° 41'N, 129° 53'W) and did soil sampling during the field season.

Scurry Rainbow Oil Limited (19) did some 1,500 feet of underground exploration on the Clark claims east of McQuesten Lake (106 D 2 and 3, 64° 06'N, 134° 50'W) which are currently held under option from Bullion Mountain Mining Limited. At the end of August the company began underground diamond drilling. The underground work follows drilling and geophysical surveys conducted in 1972 and earlier on this 1968 discovery. Exploration targets are narrow, silver-bearing galena and sphalerite veins and replacements in a deformed limestone horizon in quartzite and quartzose phyllite.

Canadian Reserve Oil and Gas Limited (19) completed geochemical and geological surveys and 670 feet of diamond drilling on the NAT claims on Rambler Hill (106 3, 64° 15'N, 135° 15'W). Line cutting and geochemistry were carried out on the DOG claims, also on Rambler Hill (106 D 3, 64° 15'N, 135° 14'W). These claims are optioned from Silver Spring Mines Limited. The claims are underlain primarily by sheared, phyllitic sediments which contain thin veins of silver-bearing galena and sphalerite.

The Barringer AIRTRACE® airborne geochemical system in both fixed wing and helicopter applications.

High sensitivity aeromagnetic instrumentation panel in the aircraft, showing digital acquisition, crystal time clocks, barometric and radio altimetry.



Rio Plata Silver Mines Limited (20) conducted surface exploration on its FORMO, AZTEC, HACIENDO, CARIBBEAN, CHICO, CAPRICORN and SILVER BASIN claim groups in the Keno-Elsa area (105 M 4, 63° 56'N, 135° 22'W) during August and September, including 1,800 lineal feet of trenching approximately 12 feet deep.

Archer, Cathro and Associates (21) conducted a program of detailed geological mapping, bulldozer trenching and 2,400 feet of diamond drilling on its HOD zinc property 20 miles southeast of Ross River (105 G 12, 61° 33'N, 130° 35'W). Sphalerite occurs in limy sections of graphitic phyllites and schists.

Atlas/Dynasty (22) completed 2,000 feet of diamond drilling in five holes on the FOTO claim group on geophysical targets (105 K 7, 62° 15'N, 132° 45'W). The joint venture also did 40 line miles of TURAM survey on the ROTO-GRAN claim groups (105 K 5, 62° 28'N, 133° 50'W), and 15 miles on the HO-HO and BRAM claims (105 K 2, 62° 15'N, 133° 00'W).

Dynasty Explorations Limited (9) conducted a full season of exploration on the PLATA claim group in the Hess Mountains (105 N 8, 63° 33'N, 132° 00'W) following encouraging results from its diamond drilling program of 1972. Work consisted of bulldozer trenching and detailed geological mapping. The company reports that the principal vein fault zone is 6,000 feet long and persistent for at least 1,700 feet vertically. Both the principal zone and subsidiary veins adjacent to it are high in silver and lead.

Cyprus Exploration (22) did geological mapping and diamond drilling of the Mt. Mye zinc property (105 K 6, 62° 25'N, 133° 07'W) jointly owned by *Mercury Explorations*, *Giant Yellowknife Mines Limited* and *Kangaroo Explorations* (a Cyprus owned company).

Barrier Reef (6) staked and began initial exploration of promising zinc showings in dolomites 15 miles northwest of Bonnet Plume Lake (106 C 7, 64° 25'N, 132° 30'W).

Cypress Resources (6) staked, did initial geological work and conducted a small diamond drilling program on the ED, PB, CVO, BPR claim block 25 miles northwest of Bonnet Plume Lake (106 C 7, 64° 20'N, 132° 55'W).

Gold-Silver

Jorex Limited and *Dome Explorations (Canada) Limited* (23) did hand trenching and detailed geological mapping on the RIDGE claims west of Bennett Lake (105 D 3, 60° 05'N, 135° 18'W), following a discovery of high grade float while prospecting in 1972. The property is underlain by grey tuffaceous volcanics intruded by a rusty weathering felsite. Gold and silver are present in one of two pyrite-arsenopyrite bearing vein systems in altered volcanic rocks.

Tungsten

Pan Ocean Oil Limited (24) did surface work on the RIETA and WO claims east of the south end of Frances Lake (105 H 2 and 7, 61° 15'N, 128° 38'W). The work consisted of detailed geological mapping and reconnaissance geochemistry followed by detailed geochemistry of the anomalies recognized. Late in the season bulldozer trenching was done on a promising anomaly but a bedrock source was not found. The area is underlain by deformed, pelitic sediments intruded by granitic rocks. Skarn zones with disseminated scheelite are present at the contact between the granites and impure limestones.

Union Carbide Exploration Corporation (25) carried out reconnaissance exploration from camps along the North Canol Road (105 J 10, 63° 00'N, 130° 15'W).

Barite

Spartan Explorations Limited (25) did surface work, mostly hand trenching, on its MOOSE claims 20 miles southwest of MacMillan Pass (105 O 1, 63° 04'N, 130° 12'W). The barite is present in two stratiform zones in argillaceous sediments.

Noranda Exploration Company Limited (7) discovered barite on its ORO claim group in the Summit Lake area (105 I 12, 62° 37'N, 129° 45'W) during detailed mapping of the property. The company carried out a drilling program to test the barite which occurs in deformed argillaceous and sandy sediments.

Coal

Teslin Exploration Ltd. continued work on the coal-bearing units on coal exploration licences 15 and 17 in the Carmacks area.

In September a one-mile road was constructed from mile 107.7 on the Klondike Highway to provide access to a drill site on licence 15. Two holes were subsequently drilled on licence 15 and one on licence 17. Coal partings and lenses up to 0.3 feet wide were observed in all the sediments on licence 15. The drill hole on licence 17 cut 10.4 feet of coal (Teslin Seam). Analysis of this latter coal indicated good coking qualities but a high ash content.

In addition to the drilling an induced polarization survey and an electromagnetic survey were conducted across known coal seams in the Carmacks area. The results indicated slight response to EM 16 but no detectable response to I.P. The conductivity of the coal is thought to be due to residual moisture in the coal.

Anvil Mines Ltd., owners of Tantalus Mine did surface trenching and underground diamond drilling at the Tantalus Mine.



Northwest Territories

Producing Mines

Production was achieved from six mines; two open pit and four underground operations producing lead, zinc, copper, gold, silver and tungsten. Lead-zinc accounted for 76 per cent of the total value of production. The Northwest Territories was the second largest lead producing region in Canada. Volume of gold production was down 18 per cent from 1972, but due to the higher price of gold the value of production was up by 37 per cent. Total value of all production in the Northwest Territories was \$164,777,000, up 40 per cent over 1972.

Lead-Zinc

Pine Point Mines Ltd. produced at a rate of 10,790 tons per day during 1973. All production was from open pit operations. Approximately 3,500 feet of underground lateral development work was completed in the M-40 ore body in preparation for underground production. Total work force in 1973 was 550 employees.

Pine Point Mines Ltd.

Type:	Open Pit
Location:	South shore of Great Slave Lake, 50 miles east of Hay River, N.W.T.
Product:	zinc and lead
Rate:	10,790 tons per day
Total Tons Milled:	3,896,357
Reserve Grade:	9.9 per cent combined lead-zinc
Reserves:	41.9 million tons
Employees:	550

Gold

Con-Rycon-Vol produced at a rate of 462 tons per day, grading 0.54 ounces gold per ton. Underground exploratory work outlined one million tons, grading 0.62 oz. gold per ton on the extension of the Campbell zone. Con collared a new shaft to mine this ore. At the end of 1973 the shaft was collared to 40 feet, a 110 foot steel head frame was erected and a 12 foot diameter sinking hoist was installed. It is expected that the shaft to extend to the 5,600 foot level, will be completed in two years. Total work force during 1973 was 207.

Con-Rycon-Vol Mine

Type:	Underground
Location:	1.5 miles south of Yellowknife
Product:	gold
Rate:	462 tons per day
Total Tons Milled:	168,696
Reserve Grade:	0.576 ounces per ton
Reserves:	10 years at present rate of production
Employees:	207

Giant Yellowknife Mines Ltd. continued milling at a rate of 1,067 tons per day grading 0.41 ounces gold per ton compared to 0.50 in 1972. Ore was mined from the Giant, Lolor and Supercrest mines which are all interconnected. Giant employs 358 men on its Yellowknife operation. Some trackless mining equipment was used to mine surface pillars resulting in lower mining costs permitting the mining of lower grade ore.

Giant Yellowknife Gold Mines Ltd.

Type:	Underground
Location:	1.5 miles north of Yellowknife
Product:	gold
Rate:	1,067 tons per day (including ore from adjoining Supercrest and Lolor properties)
Total Tons Milled:	389,460
Reserve Grade:	0.50 ounces per ton
Reserves:	745,000 tons
Employees:	358

Silver-Copper

Echo Bay Mines Ltd. situated on Great Bear Lake continued to operate throughout the year at a rate of 98 tons per day with a work force of 91 men.

Echo Bay Mines Ltd.

Type:	Underground
Location:	Great Bear Lake
Product:	silver-copper
Rate:	98 tons per day
Total Tons Milled:	37,393
Reserve Grade:	82 ounces silver per ton
Reserves:	unknown
Employees:	91

Terra Mining and Exploration Ltd. located on Rainy Lake, 10 miles south of Great Bear Lake operated throughout the year at a rate of 113 tons per day with a total work force of 53 men. In 1973, the mill put through 40,000 tons, com-

pared to 25,000 tons in 1972. Silver-copper concentrates are shipped out for refining. Total production in 1973 was 1.4 million ounces of silver and 500,000 pounds of copper.

Terra Mining and Exploration Co. Ltd.

Type:	Underground
Location:	10 miles south of Great Bear Lake
Product:	silver-bismuth-copper
Rate:	113 tons per day
Total Tons Milled:	38,787
Reserve Grade:	41.4 ounces of silver per ton and 0.8 per cent copper
Reserves:	not available
Employees:	53

Tungsten-Copper

Canada Tungsten continued production at a rate of 452 tons per day from its open pit operations on the Flat River in the Nahanni area. Underground development work commenced on a new ore body discovered in 1972 adjacent to the open pit. A decline was driven into the ore zone and a total of 7,827 feet of lateral development was completed by the end of the year. It is anticipated that production will be attained from the underground deposit by April or May, 1974. Total work force in 1973 was 85 men, plus an additional open pit mining crew of 75 for the four-month mining period.

Canada Tungsten Mining Corporation

Type:	Open Pit
Location:	125 miles north of Watson Lake, Yukon Territory
Product:	tungsten
Rate:	452 tons per day
Total Tons Milled:	165,000
Reserve Grade:	1.19 per cent WO_3
Reserves:	not available
Employees:	85

Developing Properties

Lead-Zinc

Mineral Resources International (1) has completed a feasibility study on its Strathcona Sound lead-zinc property on Northwest Baffin Island. Reserves are reported as 6,970,000 tons averaging 14.1 per cent zinc, 1.4 per cent lead and 1.8 oz. silver per ton in the main ore body.

Arvik Mines Ltd. (2) has initiated feasibility studies on its zinc-lead property of 250 claims on Little Cornwallis Island about 60 miles northwest of Resolute, N.W.T. The company is owned 75 per cent by Cominco and 25 per cent by Bankeno Mines Limited. Reserves are reported as being 25 million tons of 20 per cent combined zinc-lead. Cominco reports a 3,700-ton bulk sample of lead-zinc ore was shipped from the property in September on board the motor vessel *Helga Dan*. The shipment was for metallurgical testing as part of the feasibility study.

Gold

Cominco Ltd. announced a major new deep ore find at the Con-Rycon-Vol mine in Yellowknife which will add additional life to the mine. The company is presently sinking a 5,600-foot shaft to better serve the lower levels of the mine. Ore reserves are reported as one million tons, grading 0.62 oz. of gold per ton.

Tungsten

Canada Tungsten's exploration drilling on its Flat River property has revealed a new mineral deposit with a reported preliminary estimate of four million tons of material, averaging 1.6 per cent tungsten trioxide and 0.22 per cent copper. A decline and lateral development for a total of 3,800 feet was driven to provide for further exploration and production. Mining of this new deposit should commence in 1974.

Mineral Exploration

Mineral exploration expenditures in the Northwest Territories were up substantially from 1972 and probably approached the 10 million dollar mark for the first time since 1968. This was the direct result of new discoveries of lead and zinc in the Mackenzie and Selwyn Mountains, the higher prices on world markets for base metals, gold and silver and the increasing interest in the North due to improvements in the transportation network.

The highlights of the year include the completion of a feasibility study of the Strathcona Sound deposit, the underground development work at Arvik, CanTung, Hop Bay and Pine Point, the staking activity in the Godlin Lake area and the drilling results at Hackett River.

New staking amounted to 15,303 claims by the end of the year, an increase of 175 per cent. Areas within which considerable staking occurred include: the Godlin Lakes area (8), a result of lead and zinc discoveries by *Welcom North Mines Ltd.* and others; the Kazan Falls area south of Baker Lake where *Pan Ocean Oil Ltd.* (26) extended its claims over and around uranium discoveries, and the central Arctic Islands, where *Cominco Ltd.* (27) and

Canadian Superior Exploration Ltd. continued to protect ground explored under prospecting permits.

A total of 19 prospecting permits were issued in late March, which brought the number of currently held permits to 47.

Lead and Zinc Arctic Islands

Cominco Ltd. (28), in addition to working at and in the vicinity of the Arvik Mine on Little Cornwallis Island and on Truro and Dundas Islands, carried out exploration on Cornwallis Island, Devon Island, the Grinell Peninsula, Bathurst Island and Somerset Island. Work included diamond drilling, geological mapping and ground geophysical surveys.

Canadian Superior Exploration Ltd. (29) carried out reconnaissance geological mapping and silt sampling surveys on its permits on Cornwallis Island.

Generally, but not exclusively, in the above areas, interest has focussed on the Ordovician Thumb Mountain Formation, in which the orebody occurs at Arvik's Polaris Mine on Little Cornwallis Island.

On northwestern Baffin Island, *Trigg, Woollett and Associates* on behalf of *Global Arctic Resources*, (30) carried out a major exploration program involving trenching, geological mapping, IP and EM surveys and geochemistry on the large TR claim block in the Adams River area, east of the Strathcona Sound deposit. Investigations were also carried out on the smaller GO, DEE and SE claim blocks farther to the east in the Alpha River and Robertson River areas. Interest centres on ground underlain by the Society Cliffs Formation, a dolomite of Helikian age, in which the Strathcona Sound deposit occurs.

Central Mackenzie District

Cominco Ltd., (11) in the Hackett River area, continued with a program of diamond drilling, geological and geophysical surveys, including EM, magnetic and gravity surveys, on its Bathurst Norsemine option. Further inter-sections of silver-zinc-lead mineralization were made, in some cases, with accompanying copper values.

Texasgulf Inc. (31) carried out exploration, with an emphasis on geological reconnaissance, on its permit in the Takijug Lake area, 86-1-2. Some vertical and horizontal loop EM was also carried out as a follow up to an airborne electromagnetic survey. A 12 to 19-man crew was employed.

Conwest Exploration Co. Ltd. (32) carried out diamond drilling on its ROC claims in the Pine Point area.

Godlin Lakes Area (8)

The Godlin Lakes area is located 120 miles southwest of Norman Wells and 180 miles northeast of Ross River. The Godlin Lakes area is transected by the old Canol Road which is now impassable to conventional road vehicles between MacMillan Pass and Norman Wells. Access to Godlin Lakes is by float or wheel-equipped aircraft. Fixed-wing aircraft are usually restricted to a less than gross take-off capacity because of the high altitude and confined take-off area.

Welcome North Mines Ltd. was responsible for the interest in the Godlin Lakes area this year. Through agreements with *Peter Risby* and *Arrow Inter-America Corporation*, and as a result of early staking in February, *Welcome North Mines Ltd.* was able to obtain ownership of all the known showings in the area. *Welcome North Mines Ltd.* subsequently optioned some of the properties to *Cominco Ltd.*, *Bethlehem Copper Corp. Ltd.*, *Conwest Exploration Co. Ltd.* and other companies. This summer *Welcome North Mines Ltd.* conducted a multiphase exploration program in which one crew was involved in prospecting and staking while another completed detailed mapping over the staked ground. Near the end of the summer, when the detailed mapping was completed, the two crews were involved in reconnaissance prospecting towards the northwest. *Welcome North Mines Ltd.* also completed a detailed stream sediment geochemical survey over its prime target area northwest of Godlin Lakes. As a result of the program it staked a number of new claim groups to cover the new showings.

Agilis Engineering Ltd. mobilized a staking crew from Summit Lake into the Godlin Lakes area in June and staked the BACK, BONE and LIN claims. These claims were obtained during the Godlin Lakes staking rush in an attempt to cover favourable ground. Cursory prospecting, undertaken during claim staking, failed to reveal any mineralization.

Bethlehem Copper Corporation Ltd. optioned the DEE-FALL-QUEST claims from *Welcome North Mines Ltd.* and initiated its field program in June. A prospecting, geological mapping and geochemical sampling program was completed over the property. Galena and sphalerite occur in small isolated pods within Whittaker Formation dolomite along a northwest-striking fracture zone.

Canada Tungsten Mining Corporation Ltd. had a three-man prospecting crew based on June Lake during part of June.

Cominco Ltd. optioned the BEAR-TWIT claims from *Welcome North Mines Ltd.* and completed a prospecting, geochemical and geological mapping program over the property, which was followed by a small drilling program of about 1000 feet.

Another *Cominco Ltd.* crew was involved in a regional prospecting program exploring the contact between Paleozoic shales and carbonates. This crew was based on Mountain Lake and then on June Lake for part of the summer.

Conwest Exploration Co. Ltd., in partnership with *Cassiar Asbestos Corporation Ltd.*, optioned the ART-EKWI claims and the RAIN-SNOW claims from *Welcome North Mines Ltd.* A prospecting and geological mapping program on the ART-EKWI claims indicated lead and zinc along a fracture zone over a strike length of 5,000 feet. The mineralization occurs as galena and sphalerite in narrow cross fractures within Landry Formation limestone. *Conwest* completed a geological mapping and stream sediment geochemical survey over the RAIN-SNOW group.

Dynasty Explorations Ltd. had a crew based out of Mountain Lake. This crew performed a regional geochemical exploration and prospecting program and as a result of its efforts staked the ALP claims. *Dynasty* also optioned the KEG group from *Welcome North Mines Ltd.* and completed a drill program over the main showing. Pyrite and sphalerite were found along a shale-carbonate contact.

El Paso Mining and Milling Co. and *Godlin Copper Ltd.* (33) each had a small prospecting crew located near the junction of the Keele, Godlin and Twitya Rivers for part of the summer.

Harman Management Ltd. was predominantly involved in contract staking for many companies in the Godlin Lakes area but also staked and prospected a few areas for itself.

Hudson Bay Exploration and Development Co. Ltd. staked the RUS group adjacent to the northwest side of the DEE-FALL claims. The area was prospected for part of the summer but no mineral showings were reported.

Perry River Nickel Mines Ltd. was active in the Godlin Lakes staking rush during June and acquired a number of claim groups. The company also optioned the LAND claim from *Welcome North Mines Ltd.* but did not do any work on its Godlin Lakes properties this summer.

Rio Tinto Canada Exploration Ltd. had a staking crew in the Godlin Lakes area during March and obtained the NOR-MAN-WELLS claims. Prospecting indicated that the numerous gossans in the area were produced by weathered pyrite in a quartzite unit.

Texasgulf Inc. (34) performed a regional exploration program through the Mackenzie and Selwyn mountains. Its primary target was the shale-carbonate interface of Paleozoic reef environments, which could possibly contain lead-zinc mineralization.

Vestor Explorations Ltd. staked four claim groups during the staking rush and prospected a portion of its holdings. An occurrence of sphalerite lining narrow fractures was found in scree on the KEV claims.

Summit Lake Area (7)

Summit Lake is located 120 miles north of Watson Lake and was either the base or the supply transfer point for many companies working in the area. It may be reached by fixed-wing float-equipped aircraft. A helicopter is essential for easy access from the lake to most of the properties.

Canex Placer Ltd. continued detailed prospecting, soil geochemistry and geological mapping on its Summit Lake holdings and initiated an extensive trenching and drilling program within the N.W.T. on its main showings on the Y claims. The trenching attempted to expose bedrock but in most cases the weathered layer was very deep and only crumbly shale was exposed. This year's drill program, totaling more than 15,000 feet in 26 drill holes, was directed towards obtaining maximum structural and geological information.



Canex Placer Ltd. plans to continue its drill program during the 1974 field season.

Agilis Engineering Ltd. conducted detailed soil geochemical surveys over properties held by *Acheron Mines Ltd.*, *Cream Silver Mines Ltd.* and *Teck Corporation Ltd.* Samples were taken on a 400 foot by 200 foot grid from the B horizon and were analyzed by XRF. *Agilis Engineering* was sampling the zones underlain by shale in an attempt to find mineralization similar to that on *Canex Placer's* property.

Cominco Ltd. had a crew based on Cominco Lake involved in local exploration programs on its Summit Lake claim groups. The properties were prospected, soil sampled and geologically mapped. Another *Cominco Ltd.* crew was based on Grizzly Bear Lake for part of the summer and was involved in a regional exploration program. As a result of the work a large claim group southeast of O'Grady Lake was staked.

Dassan Copper Corp. Ltd. completed a prospecting and soil geochemical program over its HYL claims. These claims are underlain by Paleozoic black shales and are apparently on strike with the *Canex Placer Ltd.* showings.

Dynasty Explorations Ltd. headed a consortium of companies composed of *Shield Resources Ltd.*, *Atlas Exploration Co. Ltd.*, and *Numac Oil and Gas Ltd.* which had a crew based on Cominco Lake. They completed a regional stream sediment geochemical program as well as prospecting, soil geochemical and geological programs on their Summit Lake claim groups.

Newmont Mining Corporation of Canada had a prospecting crew based on Grizzly Bear Lake for part of the summer.

Quintana Minerals Corp. completed a prospecting and geochemical program between Grizzly Bear Lake and O'Grady Lake. A number of claim groups were staked southeast of O'Grady Lake.

Serem Ltd., in conjunction with *Harman Management Ltd.*, staked the CAN claims east of O'Grady Lake. This area is underlain by Ordovician to Silurian carbonate and shale which has been intruded by a Cretaceous quartz monzonite stock. Mineralization occurs as an extension of the stibnite, boulangerite, jamesonite, galena and arsenopyrite vein material found on the STIB claim group located at the southeast corner of the CAN claim group.

Vestor Explorations Ltd. holds several claim groups in the Summit Lake area, one of which, the CINQ group, is located within the N.W.T. This group lies adjacent to the southwest edge of the property of *Canex Placer Ltd.* south of the main showings. The CINQ group is underlain by Lower Paleozoic carbonates and by Devonian shales. A 12-man crew was on this property for part of the summer and completed a prospecting, geological mapping and soil geochemical program over the area. A large zinc anomaly was found in an overburden area and a gravity survey was conducted over this geochemical anomaly.

Wrigley Area (35)

Cominco Ltd. continued its prospecting, geochemical, geological and diamond drilling program this year on prospecting permit west of Wrigley. The area is underlain by a north-trending ridge containing Nahanni Formation limestone, Headless Formation shale and Arnica Formation dolomite which have been folded into an anticline.

Mineralization occurs as galena, sphalerite and smithsonite along fracture zones within Nahanni Formation limestones. The fracture zones strike approximately parallel to the major anticlinal axis in the area and are usually bordered by a narrow silicified and dolomitized zone. Eight drill holes totalling 3,600 feet were completed this summer.

Giant Yellowknife Mines Ltd. obtained two prospecting permits covering NTS 95 0 5 and 95 0 6. The company engaged *Geophoto Services Ltd.* to complete a stream sediment geochemical survey over the permit areas.

Great Plains Development Co. of Canada Ltd. completed a regional reconnaissance exploration survey along the front ranges on the east side of the Mackenzie Mountains during August.

Union Oil Co. of Canada Ltd. (36) obtained five prospecting permits lying between Wrigley and Nahanni. Buttrick Trigg, Woollett and Associates Ltd. was engaged to complete a regional prospecting program and a stream sediment and skree-fine geochemical survey over the area. The prime target areas were reef structures and Cambrian to Devonian carbonates, mainly within the Manetoe, Landry, Arnica and Nahanni Formations.

Copper

Exploration for copper and associated base metals continued to be widespread throughout the Northwest Territories.

Keewatin District

In early summer, *Questor International Surveys Ltd.* (37) flew 3,000 line-miles of magnetometer and electromagnetometer surveys over the four prospecting permits in the Maguse Lake–Wallace River area acquired by *Aquitaine Company of Canada Ltd.* in April 1973. The permits cover an arcuate band of metasediments, felsic volcanic and intermediate tuffs in contact to the east, south and west with intermediate to mafic metavolcanics and intruded to the north by biotite adamellite. A seven-man crew, using a helicopter and based in Whale Cove, carried out ground geological and geophysical follow-up surveys on the most interesting anomalies. A few anomalies outside of the permit areas were staked.

At Spi Lake *Freeport Canadian Exploration Company* (38) conducted a drilling program totalling 5,595 feet in nine holes in an attempt to outline down-dip extensions of the showing previously explored by *Giant Yellowknife Mines Ltd.* on the DEE claims.

Midwest Drilling Ltd. drilled 3,000 feet to test four geophysical anomalies within the area held under prospecting permits by *Canadian Superior Exploration Limited* west of Carr Lake (58). A geologist was engaged to carry out geological mapping northwest of Carr Lake.

Noranda Exploration Co. Ltd. (38) engaged *Questor International Surveys Ltd.* to fly a 1,500 line-mile electromagnetometer and magnetometer survey over its prospecting permit, in the Yandle Lake area, which they acquired in 1973. A nine-man crew of geologists spent most of the summer mapping the permit area and examining claim groups staked to cover parts of a band of felsic volcanics to the east. The northwest quarter of the permit area is underlain by granitic intrusives in contact to the south-east with mafic to intermediate volcanics and sediments of the Kaminak Group.

A seven-man crew from *Aquitaine Company of Canada Ltd.* (39) spent four or five days in Baker Lake examining its claim groups northeast of Baker Lake in the Ketyet River area.

In the latter part of the summer *Aquitaine Company of Canada Ltd.* (40) had this same crew working from its camp

on the Barrow River doing geochemical water sampling over a fairly large part of the southern Melville Peninsula.

Mont Elta Projects Ltd. (40) prospected in the Tavani area.

Central Mackenzie District

Seaforth Mines Ltd. (41) carried out an IP survey and a prospecting program on the MJ group, near the Terra Mine where chalcopyrite occurs in fine fractures and disseminations throughout an altered porphyritic host rock.

Seaforth Mines Ltd. (49) also conducted a geochemical survey over portions of the OS and ZED claims on the west shore of Hottah Lake.

Giant Yellowknife Mines Ltd. (58) carried out drilling on the G and GAP groups on Wildbread Bay, Great Slave Lake. Chalcopyrite and bornite mineralization is found in quartz-carbonate veins in dolomite of the Utsingi Formation of Aphebian Age.

Norcan Minerals Ltd. (46) mapped part of its BEV claims at the mouth of the Thubun River and did some trenching on its claims on Petitot Island.

Godlin Lakes Area (8)

Bethlehem Copper Corp. Ltd., optioned the TET-RAP claims from *Welcome North Mines Ltd.* and completed a geological mapping, soil geochemical and diamond drilling program over the property this summer. Mineralization occurs as tetrahedrite in erratic high grade pods along a fracture system within the Little Dal dolomite. Two diamond drill holes totalling 601 feet tested the main zone.

Welcome North Mines Ltd. completed a preliminary prospecting program over the NITE group. This area is underlain by maroon mudstone and cherty dolomite of the Lower and Middle Rapitan Group. The cherty dolomite may be up to 200 feet thick and contains thinly layered, algal mat sections. Copper mineralization occurs as disseminated chalcopyrite and bornite within the cherty dolomite zone and seems to be concentrated just below the algal mat sections. Bornite, quartz and calcite fill narrow, discontinuous fractures within the cherty dolomite. Azurite and malachite commonly coat the weathered surface of copper-bearing material.

Copper-Nickel

Keewatin District

D. Meunier and A. Bridges (42) staked the 16 LAMOON and 19 T'GOOD claims in April 1973 to cover a train of mineralized boulders they discovered on the north shore of Helika Lake. The boulders are reported to contain three per cent nickel and three per cent copper. *Selco Mining Corporation Ltd.* staked 296 HE claims on the east, north and west edges of the original group.

Aquitaine Co. of Canada Ltd. (43) drilled approximately 2000 feet on a copper-nickel showing on the BIL claims within the area of the newly acquired prospecting permit on the northern Melville Peninsula. The showing, 50 miles west of Hall Beach, consists of pyrrhotite, pentlandite and chalcopyrite disseminated along the edges of an 1800 foot long and 800 foot wide outcrop of amphibolite.

Perry River Area

Perry River Nickel Mines Ltd. (44) continued exploration in the Perry River area near the Arctic Coast. Diamond drilling was carried out over more or less coincident IP, EM and magnetic anomalies, on the OTOK claims. The anomalies suggest the presence of a folded conductor. Rock types in the area include ortho- and paragneisses. Norites are also reported.

On the PRN claims near the mouth of the Perry River an IP survey was carried out. In this area boulders of norite containing nickel-copper mineralization have been found. No material of comparable grade has yet been found in place and the source of the boulders has not as yet been established.

Other Base Metals

In the Clinton-Colden Lake area the presence of boulders of zinc ore on *Windflower Mines Ltd.* (45) CC claims on the north side of the lake resulted in some interest in this area. In the area of mineralized boulders, it appears that felsic and mafic volcanics of the Yellowknife Supergroup are interstratified. About 20 miles to the west, south of Alymer Lake, *Great Plains Development Company of Canada Ltd.*, carried out general exploration, culminating in staking along a belt of Yellowknife volcanics.

At the south end of an island immediately south of Rideau Island in Bathurst Inlet (11) prospecting led to the staking of the WOLF claims over a lead showing.

A copper showing in the vicinity of Nonacho Lake (46) was staked by *J. Larkin*. Chalcopyrite, minor chalcocite and considerable malachite staining are present in a calcic clastic zone in granite gneiss.

Giant Yellowknife Mines Ltd. (47) carried out a drilling program consisting of seven holes to examine a Turam conductor located on the RED claims in the Matthews Lake area. Contact zones between mafic and felsic volcanics and sediments of the Yellowknife Supergroup were explored.

Hudson Bay Oil and Gas Ltd. (55) carried out drilling on the HOB claim group, north of the Snowdrift River near the McDonald Fault. A mylonitic zone in the Proterozoic rocks near the fault was intersected by two holes totalling 430 feet to test a geophysical anomaly detected in 1971.

Getty Mines Ltd., in partnership with *Shield Resources Ltd.* and *Numac Oil and Gas Ltd.*, mapped portions of their claim groups on the Beaulieu River (29) on which aerial geophysics and diamond drilling programs were conducted in 1970 and 1971.

Silver

Hope Bay Mines Ltd. (48) carried out underground exploration on the Ida Point and Roberts Lake showings, south of Elu Inlet. Declines were put down on each showing to follow up indications of silver ore encountered in previous trenching and drilling. Cross cutting, drifting and raising were carried out from the declines. The declines on the Ida Point and Roberts Lake showings are approximately 300 and 400 feet in length respectively. High grade silver is found locally in calcite cemented breccia in fractures penetrating mafic Archean metavolcanics.

Aerial Prospecting

The Barringer AIRTRACE® airborne geochemical system in both fixed wing and helicopter applications.





MINERAL EXPLORATION AND MINING - YUKON & N.W.T.

SCALE OF MILES
0 100 200 300 400

LEGEND



PRODUCING MINE

RAILWAY



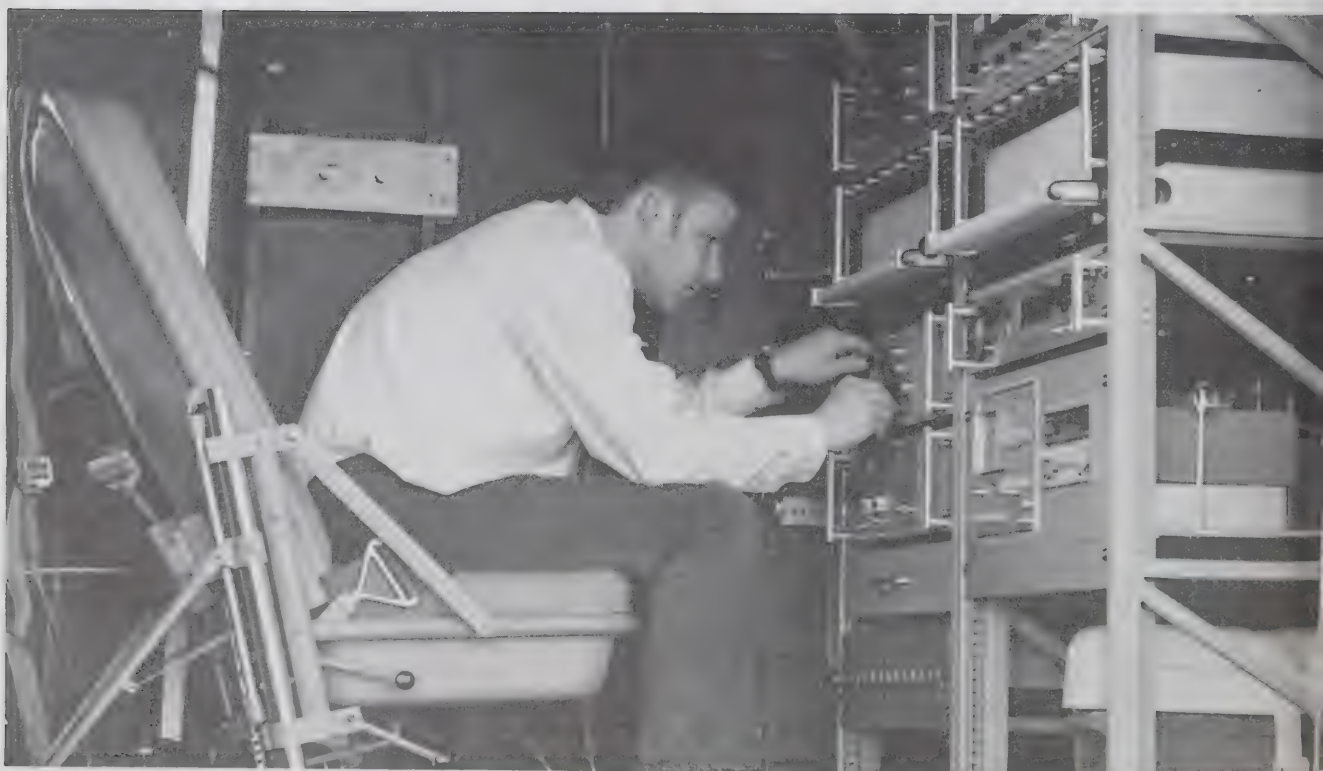
AREAS OF ACTIVITY

COMMERCIAL AIR ROUTE

EXISTING ROAD

- | | |
|---|--------------------------------|
| A Giant Yellowknife Mines Ltd. Au | I Tantalus Butte Coal Co Coal |
| Con-Rycon Mine Au | J Hudson-Yukon Mine Ni Cu |
| B Echo Bay Mines Ag Cu | K Terra Mining & Expl. Ltd. Ag |
| C Canada Tungsten Mining C. Ltd. WCu | |
| D Pine Point Mines Ltd. Pb Zn | |
| E United Keno Hill Mines Ltd. | |
| Pb Zn Ag Cd | |
| F Whitehorse Copper Mines Ltd. Au, Ag, Cu | |
| G Cassiar Asbestos Corp. Ltd. Asb | |
| H Anvil Mining Corp. Ltd. Pb Zn Ag | |





Duke Mining Ltd. (49) completed 2900 feet of diamond drilling in nine holes on the No. 1 showing at the south end of Black Bear Lake, three miles southwest of the Terra Mine. Inclined holes were drilled northward into a vein structure in which high bismuth values had been locally encountered.

Some additional drilling was done on the ED claims, belonging to *F. Diamon*, situated on the shore of the East Arm of Great Slave Lake, some 20 miles northeast of Rocher River (46).

Gold

Several known gold prospects were re-examined during 1973 in light of the substantial increase in the price of gold on world markets.

Keewatin District

O'Brien Gold Mines Limited (10) engaged Midwest Drilling Ltd. to do some 10,000 feet of diamond drilling on two gold showings in the Kognak River-Cullaton Lake area previously explored from 1961 to 1964 by *Selco Mining Corporation Limited*. Two holes totalling 1,000 feet were drilled on the Shear Lake Zone. The remaining 9,000 feet of drilling, in holes averaging 300 to 500 feet long, tested the B-zone showing in sections at 50 foot intervals. *Selco Mining Corporation Limited's* previous work outlined 100,000 tons of ore grading one ounce per ton gold. The gold occurs in sulphide-rich bands in quartz-magnetite iron formation inter-bedded with greywacke and mafic volcanics of the Kaminak Group. The iron formation is roughly S-shaped and changes in dip from vertical to nearly horizontal to steeply reversed.

Columbian Northland Exploration Ltd. mapped and sampled quartz veins on its K claims, 15 miles northwest of Imikula Lake (43).

Central Mackenzie District

Shield Resources Ltd. (50) carried out preliminary survey work on the WT group near Dome Lake in preparation for an underground exploration program in 1974.

Duke Mining Ltd. (50) optioned the TT group south of Dome Lake. Previous trenching has revealed an area containing high gold values in quartz veins in greywackes of the Yellowknife Supergroup.

Hidden Lake Gold Mines Ltd. (50) carried out a small diamond drilling program comprising five holes at its Hidden Lake property.

On the Ruth property, about four miles west of Francois Lake, *Precambrian Mining Services Ltd.* carried out a drilling program on behalf of *Ice Station Resources Ltd.* (50)

Barons Oil Ltd. (51) carried out a small amount of pack-sack drilling and trenching on the JINGO claims at Shagory Lake, two miles east of Arseno Lake, where extensive quartz veins penetrate volcanics of the Yellowknife Supergroup.

General prospecting and about 200 feet of X-ray drilling in three holes on the East Boundary and North Veins were carried out on the P claim block, south of Greys Bay on Coronation Gulf (59). The area is underlain by granitic rocks and Archean greenstones containing well developed quartz veins.

Much prospecting activity in the Gordon Lake area (50) and elsewhere north and east of Yellowknife has resulted in the staking of several previously unreported gold showings. Work is proceeding to evaluate these showings.

Terra Mining and Exploration Ltd. (50) drilled two holes on a gold showing on the BEN group on an islet in Great Slave Lake lying some 20 miles southeast of Yellowknife.

Gold assays have been reported from a gold and bismuth showing near Uhlman Lake (52) 35 miles east of Port Radium.

Nor-Can Minerals Ltd. (50) carried out a diamond drilling program on the VAL claims 18 miles southeast of Yellowknife near the shore of Great Slave Lake. This drilling was to examine a contact zone of granite and Yellowknife metasediments, in which pegmatites occur. Minor chalcopyrite and native copper occur in pegmatic rocks in this area.

Mackenzie Mountains

Prospectors have staked an old placer showing located on the south side of Nahanni National Park (53). Gold occurs in a clay layer along an old stream bed and contains concentrations up to a value of \$6 per cubic yard.

Tungsten

Interest in tungsten has continued this year as *Canada Tungsten Mining Corporation Ltd.* announced production plans for their new ore zone and *Amax Northwest Mining Co. Ltd.* released results from the preliminary investigation of the MacMillan Pass property.

Amax Northwest Mining Co. Ltd. (7) had a helicopter-supported prospecting crew working along the belt of Cretaceous quartz monzonite stocks between Tungsten and MacMillan Pass. As a result of this prospecting, the CAC claims were staked east of Summit Lake to cover a skarn zone within altered Paleozoic carbonate and shale adjacent to a granitic stock.

Canada Tungsten Mining Corporation Ltd. (57) had a small prospecting crew working in the Tungsten area. A large block of claims was staked due east of the present mine site to cover mineralized skarn zones with Paleozoic sediments adjacent to Cretaceous stocks.

Uranium

Keewatin District

Pan Ocean Oil Ltd. (26) had a 13-man crew doing geochemical frost-boil surveys on a 1,000 foot grid in the Kazan Falls and Christopher Island areas, where it has already outlined a number of uranium showings in basement and Dubawnt Group rocks.

Central Mackenzie District

Getty Mines Ltd. (54) carried out exploration on its permits and claims in the Lever Lake area. A field crew of

about 12 men were employed. Radiometric surveys were carried out as a follow-up to previous lake water sampling. Geological mapping was completed on the permit area and the OK claims.

A number of companies, including *Denison Mines Ltd.* *B.P. Minerals Ltd.* examined several uranium prospects in the Nonacho Lake area (46) and the area between Yellowknife and Great Bear Lake (54).

At Mountain Lake, south of the Dismal Lakes, *Trigg, Woollett and Associates Ltd.* (56) carried out work on YUK claims, north of *Aquitaine Co. of Canada Ltd.*'s PEC claims. The claim area is probably underlain by Palaeohelikian sediments of the Hornby Bay Group although outcrop is less than two per cent and emphasis has been placed on boulder tracing.

Other Minerals

Anglo American Corporation of Canada, Cominco Ltd. and *DiaPros Ltd.* (27) carried out staking and ground examinations of kimberlite pipes on central Somerset Island. It is understood that bulk sampling was carried out but no reports of diamonds being present have been received.

Milchem Ltd. (58) carried out work on a barite deposit four miles east of Snowdrift.

Minalta Coal Ltd. (33) examined and sampled surface outcrops of coal on its licences near Norman Wells.

Northern Natural Resources and Environment Branch

The Northern Affairs Program of the Department of Indian and Northern Affairs was reorganized in 1973 to provide the structure that is necessary to properly carry out the Department's responsibilities within the framework of the government's northern policy. As part of this program and in line with the federal government's objectives, the Northern Natural Resources and Environment Branch is responsible for establishing appropriate resource and economic development programs and the protection and conservation of the northern environment.

Tasks of the branch are to seek out and identify all possible ways and means of expanding the economy of the North at a more rapid pace; to develop a broad plan of economic progress and to recommend specific programs and policies for achieving these objectives.

Measures have been taken to ensure the protection of the environment of the Canadian North which at the same time allow development to proceed at a reasonable rate. These measures are designed to balance environmental protection with developmental activities.

To meet objectives the government has instituted a number of assistance programs to help the mineral industry overcome some of the high costs of operating in the North. These programs, which are the responsibility of the Northern Policy and Program Planning Branch, include the Northern Mineral Exploration Assistance Program, Prospectors' Assistance Program, Road and Airstrip Assistance Programs and Assay Services. In addition, financial support is given to organizations which assist in northern mineral development, such as Chambers of Mines and Accident Prevention Associations.

In order to discharge its functions, the Northern Natural Resources and Environment Branch is subdivided into Oil and Minerals Division and Water, Lands, Forests and Environment Division.

This publication provides details of mining activity north of 60°, and since the management of mining lands in this region rests with the Oil and Minerals Division, the responsibilities of that Division and its Mining Section in particular are described in more detail on the following pages.

Oil and Minerals Division

The Oil and Minerals Division of the Northern Natural Resources and Environment Branch is responsible for the management and administration of Crown mineral rights in the Yukon and Northwest Territories.

The Division has the responsibility of formulating and recommending policies designed to encourage resource exploration and development, including the terms of disposal of mineral rights. It also plans and assesses programs designed to provide an adequate infrastructure so that the natural resources, when found, can be properly developed and delivered to the market.

Mining Section

This section is responsible for the administration of mining and mineral rights (excluding oil and gas) from the acquisition of claims through to the production stage, including safety in mines. The section is comprised of three units—Mining Lands, Exploration and Geological Services and Engineering and Inspection Services. The responsibility for these operations rests with the Administrator of Mining.

Department of Indian Affairs and Northern Development

Minister: Jean Chrétien, Ottawa, Ontario

Deputy Minister: H. B. Robinson, Ottawa, Ontario

Assistant Deputy Minister: A. D. Hunt, Ottawa, Ontario

Northern Natural Resources and Environment Branch

Director: F. J. Joyce, Ottawa, Ontario

Regional Director (Y.T.): B. J. Trevor, Whitehorse, Y.T.

Regional Director (N.W.T.): G. B. Armstrong, Yellowknife, N.W.T.

Oil and Minerals Division

Assistant Director: H. W. Woodward, Ottawa, Ontario

Mining Section

Administrator of Mining: J. D. Kelland, Ottawa, Ontario

Mining Lands Unit

Head: T. W. Dent, Ottawa, Ontario

Supervising Mining Recorder: B. R. Baxter, Whitehorse, Y.T.

Mining Recorders: F. V. Daly, Ottawa, Ontario

W. G. Trew, Whitehorse, Yukon Territory

O. C. Paton, Dawson, Yukon Territory

R. G. Ronaghan, Mayo, Yukon Territory

W. B. Jewett, Watson Lake, Yukon Territory

R. L. Williams, Yellowknife, Northwest Territories

Engineering and Inspection Services Unit

Chief Mining Engineer: S. Homulos, Ottawa, Ontario

Regional Mining Engineers: G. Needham, Whitehorse, Y.T.

M. L. Brown, Yellowknife, N.W.T.

District Mining Engineers: T. G. Csizmazia, Whitehorse, Y.T.

E. Bengts, Yellowknife, N.W.T.

Electrical-Mechanical Engineer: M. Bond, Whitehorse, Y.T.

Environmental Control Engineer: A. Patrick, Yellowknife, N.W.T.

Mine Rescue Superintendents: N. Boss, Yellowknife, N.W.T.

J. D. Barraclough, Whitehorse, Y.T.

Exploration and Geological Services Unit

Head: A. D. Oliver, Ottawa, Ontario

Regional Geologists: D. B. Craig, Whitehorse, Y.T.

R. W. Hornal, Yellowknife, N.W.T.

Project Geologists: W. A. Padgham, Yellowknife, N.W.T.

D. Sinclair, Whitehorse, Y.T.

District Geologists: M. Milner, Whitehorse, Y.T.

P. J. LaPorte, J. Seaton, W. Gibbons, J. Murphy, Yellowknife, N.W.T.

Staff Geologist: T. W. Caine, Ottawa, Ontario

Mining Lands Unit

For administrative purposes, the Territories have been divided into seven mining districts. A mining recording staff is responsible for the disposition of mineral rights within each district in accordance with the applicable legislation. For each Territory, there is a Supervising Mining Recorder whose principal function is to ensure uniform practices are observed in the administration of the various mining acts and regulations.

During the past year, the Nahanni District Mining Recording Office was moved from Watson Lake to Yellowknife. The Watson Lake Mining Recording Office of the Yukon continues to serve as a sub-office for the Nahanni District.

The districts and locations of Mining Recorders' Offices are as follows:

	District	Office
<i>Yukon Territory</i>	Dawson	Dawson, Y.T.
	Mayo	Mayo, Y.T.
	Watson Lake	Watson Lake, Y.T.
	Whitehorse	Whitehorse, Y.T.
<i>Northwest Territories</i>	Mackenzie	Yellowknife, N.W.T.
	Nahanni	Yellowknife, N.W.T.
	Arctic and Hudson Bay	Ottawa, Ontario

Mineral claims staked and recorded in the Yukon Territory and Northwest Territories during 1973, with comparative figures for 1972, are tabulated below:

Yukon Territory

District	Claims Recorded	
	1972	1973
Whitehorse	1,922	3,100
Dawson	669	1,100
Mayo	1,784	2,500
Watson Lake	2,470	2,500
Total	6,845	9,300

Northwest Territories

District	Claims Recorded	
	1972	1973
Mackenzie	2,940	7,100
Arctic and Hudson Bay	2,022	4,800
Nahanni	593	3,300
Total	5,555	15,300



**Representation Work Reported
Northwest Territories and Yukon Territory
January–December 31, 1973**

	Trenching	Diamond Drilling	Geological Geophysical Geochemical Other	
Mackenzie District	\$ 97,768.00	\$261,223.00	\$145,331.00	\$504,32
Nahanni District	10,834.00	27,303.00	14,215.00	52,35
Arctic and Hudson Bay District	66,756.00	297,092.00	598,240.00	962,08
Total–Northwest Territories	175,358.00	585,618.00	757,786.00	1,518,76
Whitehorse District	221,259.00	348,900.00	405,313.00	975,47
Dawson District	2,221,204.00		101,040.00	2,322,24
Mayo District	201,631.00	43,372.00	261,308.00	506,31
Watson Lake District	91,495.00	147,168.00	443,382.00	682,04
Total–Yukon	2,735,589.00	539,440.00	1,211,043.00	4,486,07

**Work Performed–Prospecting Permits
Fiscal Year 1972–73**

Arctic and Hudson Bay District	\$ 409,61
Mackenzie District	\$ 535,11
	\$ 944,72

Grand Total all reported expenditures **\$6,949,56**

Engineering and Inspection Services Unit

Headed by the Chief Mining Engineer for the Yukon and Northwest Territories, stationed at Ottawa, this Unit is responsible for the implementation of the Mining Safety Ordinances and Mining Safety Rules and Regulations pertaining to safety in mines as well as the Yukon Blasting Ordinance and Regulations and the Explosives Use Ordinance in the Northwest Territories. It is responsible for amendments and preparation of new safety legislation when required, for maintenance of mine rescue stations and rescue equipment in both Territories and for the training of mine rescue personnel at the mines.

A Regional Mining Engineer is stationed at Whitehorse in the Yukon and at Yellowknife in the Northwest Territories. He is the Senior Mining Engineer with a staff composed of

a District Engineer, Electrical Mechanical Engineer, Environmental Engineer, Mine Rescue Superintendent, Claim Inspector and clerical staff who are responsible for

1. Inspections of mines, quarries and blasting operations to ensure compliance with safety legislation.
2. Inspection of mineral claims to ensure compliance with Yukon Quartz and Yukon Placer Mining Acts and the Northwest Territories Canada Mining Regulations.
3. Ensuring that sufficient mine personnel are trained in mine rescue, recovery operations and first aid.
4. Conducting ventilation, dust surveys, monitoring for radioactive contamination and carrying out environmental studies of all mining properties, both underground and surface operations.

Mine Rescue

Central Mine Rescue Stations are maintained at Whitehorse, Yukon, and Yellowknife, Northwest Territories. Substations are established at each remote mine. The Department now owns 89 Drager GB 174—four hour breathing apparatus. It is the policy of the Department to have a minimum of 12 drager units at each remote mine so that each mine has the capability of commencing a rescue operation pending arrival of additional units and trained personnel from the central station.

Mine rescue teams from both territories compete in the Canadian Mine Rescue Championship each year. In 1974, the 8th Canadian Mine Rescue Championship will be sponsored by the Department and will be held at Whitehorse, Yukon on June 22.

Mining Safety Statistics—Yukon and Northwest Territories

The American Standard method of recording work injuries is used throughout, and in the case of accidents resulting in death, permanent total disability and permanent partial disability, the number of days recorded as lost time as a result of these accidents conforms with the scheduled time charges set down in the above noted Standard.

Disabling injuries are defined as those which result in death, permanent total disability, permanent partial disability or temporary total disability.

Days recorded as lost time are calendar days lost, but do not include the day of the accident or the day of return to work.

Accident frequency is expressed as the number of accidents per 1,000,000 man-hours worked.

Accident severity is expressed as the number of days lost, as a result of accidents, per 1,000,000 man-hours worked.

Accidents Statistics—1973

In 1973 there were 84 disabling injuries reported in the Yukon Territory. The accident frequency for disabling injuries increased from 31.41 in 1972 to 32.25 in 1973. Accident severity decreased from 3,217 in 1972 to 3,136 in 1973. "Fall of persons" was the chief cause of accidents in the Yukon, accounting for 28 per cent of all accidents,

followed by "Strain while lifting" and "Miscellaneous causes". These three main causes accounted for 52 per cent of all accidents reported. There was one fatal mining accident in the Yukon Territory in 1973—a miner died of injuries sustained in a blasting accident at Whitehorse Copper Mines Ltd. on March 19.

In the Northwest Territories 57 disabling injuries were reported. The accident frequency rate decreased from 20.17 in 1972 to 19.63 in 1973, while the severity rate increased from 2,930 in 1972 to 3,162 in 1973. "Fall of persons", as in the Yukon Territory, was the main cause of accidents in the Northwest Territories, accounting for 19 per cent of all accidents followed by "Strain while lifting", "Burns" and "Miscellaneous causes". These four main causes accounted for 63 per cent of all accidents reported.

One fatal accident occurred in the Northwest Territories in 1973. On January 16, a skiptender at Giant Yellowknife Mines Ltd. died from injuries when crushed between chute bar and timber.

Exploration and Geological Services Unit

This unit provides a geological information and advisory service to those engaged in the mineral industry in the Yukon and Northwest Territories. Resident Geologists' offices are maintained in Whitehorse, Yukon, and Yellowknife, Northwest Territories. Two new core libraries were officially opened in 1973. These contain laboratory facilities for core splitting, diamond saw cutting and thin section preparation, as well as core storage facilities. They will provide a means of preserving valuable core data for the mineral industry.

The libraries, the H. S. Bostock in Whitehorse, and the C. S. Lord in Yellowknife, were named after two well-known geologists who have done much for the mining industry through their field work and mapping of our great northern regions.

Geoscience forums were held in co-operation with the Geological Survey of Canada, the Yukon Chamber of Mines and the Northwest Territories Chamber of Mines in the fall of 1973 at Whitehorse and Yellowknife. These meetings attracted a good representation from the mining and exploration community and proved to be useful in presenting the 1973 field data. These meetings will be held on an annual basis.

Resident and District Geologists carry out mineral property examinations, collect rocks and mineral specimens and

advise the mineral industry, government departments and research scientists on geological problems arising from their work in the territories. The service includes carrying out geological evaluations on mining developments in the Yukon and Northwest Territories, where government assistance is solicited, such as for the Prospectors' Assistance Program and the Northern Mineral Exploration Assistance Program.

Department geologists assist prospectors and other geologists in identifying rock and mineral specimens, by giving prospectors' training courses and in preparing geological compilation maps on mineralized areas and giving direction when requested.

The staff evaluates all geological, geophysical, geochemical and other related work submitted in respect of representation work performed on mineral claims and of work commitments on prospecting permits.

A library of released technical assessment reports is available for reading and copying by means of a microfilm system. A small library of technical books and mining publications is maintained also for public convenience in Whitehorse and Yellowknife.

Geological Survey of Canada publications, such as geological, geophysical and topographic maps, memoirs, papers and reports, are offered for sale to the public.

Maps, papers, reports and open file releases of the Exploration and Geological Services Unit are listed in Appendix 1 of this publication.

Summer field surveys and other investigations are carried out under direction of the Project Geologists. In 1974, the Exploration and Geological Services Unit will carry out the following studies :

Geological compilation maps will be prepared and field checks made in the following areas:

Minto area, Yukon 115-I-11
Rankin Inlet area, N.W.T. 55-J-13
Hackett River area, N.W.T. 76-G-12, 13
Contwoyto Lake area, N.W.T. 76-E-11
Kognak River area, N.W.T. 65-G-7, 8

Special studies will be made in the following areas:
Nadaleen area, Yukon (106-C-8) study of structure and stratigraphy of Proterozoic and Paleozoic rock units

Klondike gold field area, Yukon, 115-0

a) study of present and paleogeomorphology as an aid to the placer mining industry

b) study of lode mineral exploration in the Dawson Mining District 1900-1915.

Metal dispersion patterns in lake sediments of the Yellowknife area, N.W.T. in co-operation with the Geological Survey of Canada.

Reports in Preparation

1. Mineral Industry Report 1969-70 Volume III, Northwest Territories west of 104 west longitude.

2. Mineral Industry Report 1971-72 Volumes I, II, III, Yukon and Northwest Territories.

3. Mineral Industry Report 1973, Volumes I, II, III, Yukon Territory and Northwest Territories.

4. Geology compilation of White Eagle Falls, 86-F-12

5. Geology compilation of High Lake, 76-M-7

6. Geology compilation of Beniah Lake, 85-P-8

7. Geology compilation of Montana Mountain area, Yukon Territory

8. Geological control of ore distribution in the Whitehorse Copperbelt.

Development and Incentive Program Section

This section within the Northern Policy and Program Planning Branch is responsible for the administration of policies and development programs designed to stimulate the exploration for non-renewable resources in the Yukon and Northwest Territories.

The government has developed a series of incentive programs designed to aid both companies and individuals in exploration and development activities in the North. These incentives can be broken down into three categories, namely: the provision of infrastructure, the provision of direct financial assistance and the provision of technical assistance.

Provision of Infrastructure

Northern Roads Program

The Northern Roads Program, which was approved by the Federal Government in 1965, called for an annual expenditure of \$10 million for the following 10 years in both territories. It is the first phase of a long-range, 20-year program designed to bring permanent roads to within 200 miles of all potential areas of resource development. The policy was designed to be sufficiently flexible to allow revisions in priorities from year to year to keep pace with resource development. It is also allowed for shift in volume of construction from one territory to another, depending on the requirements and based on northern territorial development.

By 1971 the Northern Roads Policy was revised, modifying construction standards and providing for the Pioneer Resource Roads, thus making available low-cost access into areas of undeveloped natural resource potential.

The new policy reflects the government's approach to Northern Development for the coming decade, as announced by the Minister in 1972. Essentially, this policy provides for a form of balanced development by which the needs of people are paramount and the environment protected.

In order to achieve the objectives of the Northern Roads Policy, classification of roads was established wherein cost sharing formulas between Federal-Territorial-Private interests were defined. In this classification, there are two main categories of roads—(a) Communication and Network Roads and (b) Lateral Roads.

a) Communication and Network Roads are those highways and roads which provide a primary network of roads in the Yukon and N.W.T. and connecting links to the Provinces. Their initial cost is borne completely by the Federal Government. Federal Government supplies 85 per cent of maintenance costs, the Territorial Government 25 per cent. Listed under this category are:

- Trunk Highways
- Secondary Trunk roads
- Airport Roads

Since 1965 when this multipurpose \$100 million, \$10 million-a-year program was commenced, 1,282 miles of new roads at a cost of \$97.767 million have been constructed.

Dempster Highway

The Dempster Highway continued to be identified as the major construction project during 1973. From mile 0 of the highway, just south of Dawson, Y.T., the system stretches 377 miles to Arctic Red River. The route then proceeds north-west for 40 miles to its junction point with the Mackenzie Highway (Mile 931, Mackenzie Highway). By the end of December, 1973, 178 miles of the Dempster had been completed, following the route north, north-east from Dawson. An additional 35 miles were also completed, linking Fort McPherson with Arctic Red River.

Mackenzie Highway

The Prime Minister announced the acceleration of the construction of the Mackenzie Highway in April, 1972. It is the first major northern construction project that is considering the environment and the immediate and long-term well-being of the local native people as carefully as it considers construction and engineering factors.

This highway, more than 1,000 miles long, would be an all-weather link from the Alberta-N.W.T. border to the Mackenzie Delta, connecting all the communities (hitherto isolated from each other) down the Mackenzie Valley.

The only sections of the highway between Fort Simpson and Inuvik currently under construction are the 49-mile section out of Fort Simpson towards Camsell Bend and a training section, 12 miles long just south of Wrigley, which is being used for on-the-job training of native people. A contract has been completed on a 33-mile section south from Inuvik but this contract was undertaken as a stage of construction in completing the Dempster to Inuvik highway rather than completing the Mackenzie Highway.

Since the start of the Fort Simpson /Camsell Bend contract, crews of native people have been employed by Hire North in hand-clearing the highway right-of-way. Other native people have been part of D.P.W. survey crews, while others have worked as labourers and heavy equipment operators for contractors or construction crews and on the training section.

b) Lateral Roads are those roads which lead from a communication and network road to a location where resource exploration, development and exploitation is being carried out or may be carried out in the near future.

Lateral Roads are further broken down into two sub-categories—Cost Sharing and Non Cost Sharing.

Cost Sharing Roads, as the name implies, are those roads which are constructed by a resource developer but are financed jointly by the developer and the Government. Included in this sub-category are Tote Trails, Initial Access Roads and Permanent Access Roads.

Tote Trails are constructed by a resource developer and may receive a grant of up to 50 per cent of their cost of construction to a maximum contribution of \$20,000. These provide seasonal or year round access to the property of a company engaged in exploring or developing a natural resource. The Tote Trail Program is administered by the Commissioner of each territory.

Initial Access Roads may receive the same maximum assistance grant as Tote Trails, but the maximum federal contribution will not exceed \$100,000 for projects of an exploratory nature or \$500,000 for projects in the development stage. This classification provides for contributions towards more costly roads than those provided for under Tote Trails.

Permanent Access Roads lead from the nearest permanent road to the location of a resource development that has been brought into full production stage. These roads may receive a federal contribution of up to 2/3 of their cost, but the maximum contribution may not exceed \$40,000 per mile.

Financial assistance amounts to \$2,350,545 for bridges and access-road construction to date, of which \$111,750 was disbursed in 1973. The following companies, have received assistance :

Arctic Gold and Silver Mines Ltd.
Western Minerals Limited
Anvil Mining Corporation Limited
Hudson Bay Mining and Smelting Co. Ltd.
Venus Mines Limited
Mount Nansen Mines Ltd.
New Imperial Mines Ltd. (now Whitehorse Copper Mines Ltd.)
Canoe River Exploration Ltd.
J. Ray McDermott Canada Ltd.
Inexco Oil Co. Ltd.

Northern Resource Airports Program

The original program approval was on T.B. Minute No. 647905, dated November 22, 1965. It is a cost-sharing scheme for constructing small airports to provide access to mineral and non-renewable resources, exploration and development sites, tourist development sites and to improve transportation facilities. They also serve as incentives to economic and social development.

Nature of Assistance

The policy refers to construction of airports in two categories. Under the first, Government assistance is available to defray 50 per cent of the cost of an exploratory airport up to a maximum federal expenditure of \$20,000. For the second category, airstrips or airports built in connection with the pre-production or early production stage of natural resources exploitation, the Federal Government may contribute 50 per cent of the cost up to a maximum of \$100,000 per airport.

Financial assistance amounts to \$271,768 for airstrip construction assistance to date, of which \$61,060 was disbursed in 1973. The following companies have received assistance :

Bathurst Inlet Developments Limited
Triad Oil Co. Ltd. (B.P. Oil and Gas Ltd.)
International Mine Services Ltd.
Atlas Explorations Ltd.
Western Minerals Ltd.
Arctic Outpost Camps
B.P. Oil and Gas Ltd.
Stan Reynolds Outfitter
Coppermine River Ltd.
Echo Bay Mines Ltd.
Great Bear Trophy Lodge
Terra Mining and Exploration
Nordex Exploration Ltd.
Pacific Grant Steel Ores
Banff Oil Ltd.
Glenlyon Mines Ltd.

Remote Airports Program

This program is people rather than resource oriented. The program is designed to provide small isolated communities, not warranting normal airports for scheduled airline services, with gravel all-weather airstrips 3,300 feet in length, capable of meeting the essential educational health and emergency requirements of the community.

The program calls initially for the construction of 11 airports over an eight to 10-year period at an estimated cost of \$6,167,000. The program calls for the Department to set the priorities for airport construction but the actual work will be done under Ministry of Transport supervision, with a view to adhering to standards that may permit ultimate airport licensing.

Since the inception of this Program in 1969, five airports have been constructed, or are under construction, at the following communities : Coppermine, Whale Cove, Cape Dorset and Pangnirtung in the N.W.T. and Old Crow in the Y.T.

Provision for Direct Financial Assistance

Northern Mineral Exploration Assistance Program

This program is designed to encourage mineral exploration activity in the Yukon Territory and Northwest Territories. Assistance in respect of one or more exploratory programs for a single applicant is limited in aggregate to \$50,000 but not exceeding 40 per cent of the approved cost of an exploration program. A total of 122 corporate applicants have applied for assistance in one or more programs of exploratory work.

Since the inception of the Program in 1967, 186 applications have been approved and a total of \$3,778,816.79 has been paid in grants, leaving an outstanding commitment of \$722,501.42. Moreover, payments of \$9,022,500 have been made towards a large portion of oil and gas exploration in the Arctic Islands.

Prospectors' Assistance Program

In both the Yukon Territory and Northwest Territories, a combined amount of \$70,000 is available in the form of grants to aid prospectors in their search of mineral deposits. A prospector may receive up to \$900 each year to help finance his prospecting venture. The program has been well received since its introduction in 1962 and was instrumental in the location of several mineral discoveries.

During 1973, the entire amount was committed. Fifty-five prospectors in the Northwest Territories and 45 in the Yukon Territory participated in the program.

Provision of Technical Assistance

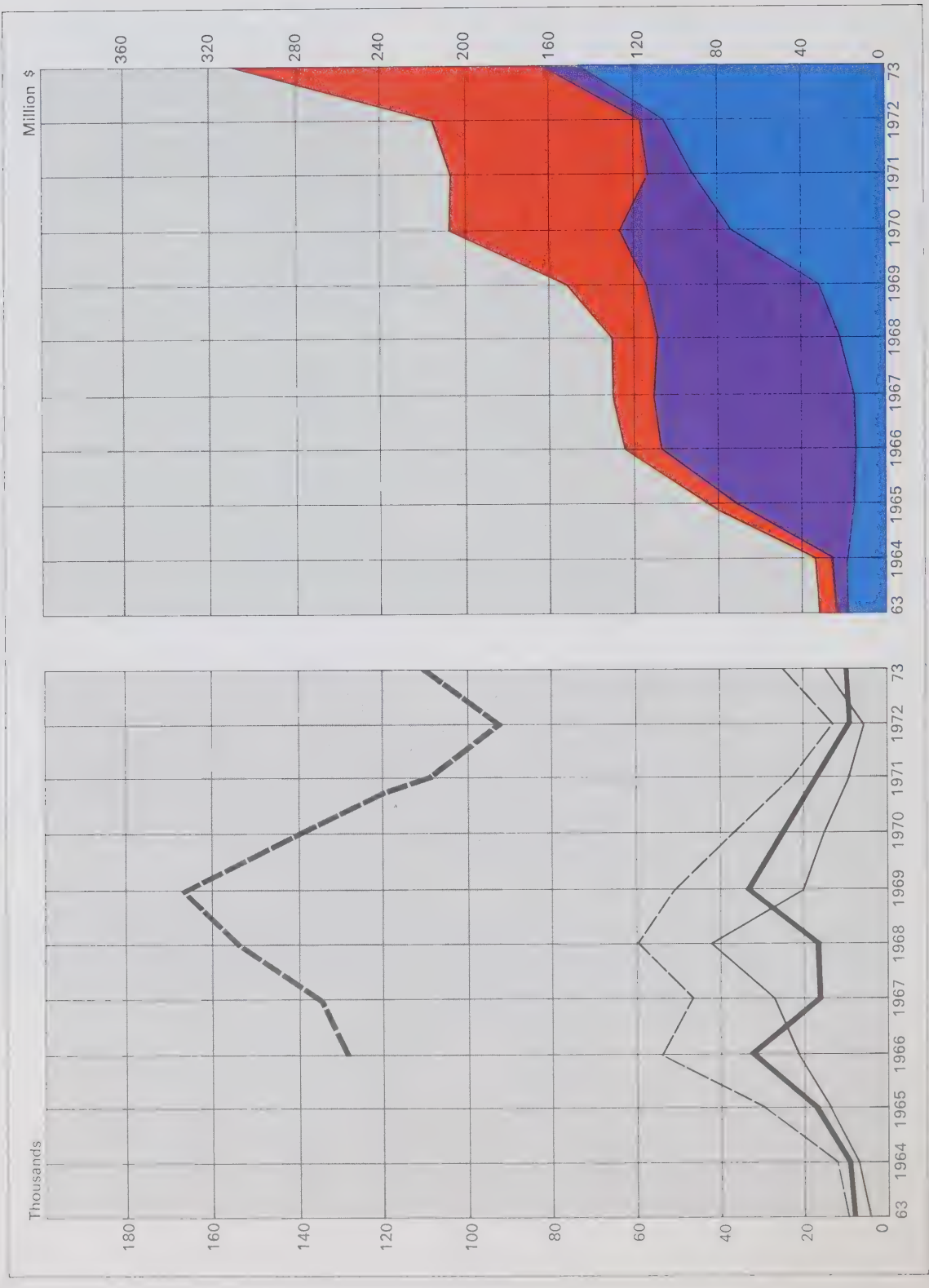
Assay Service

There were approximately 2,969 assays performed during 1973 at the Government Assay Office at Yellowknife at a value of \$13,628.

In the Yukon Territory, 50 per cent of the cost of 10 assays per prospector per year is paid by the Federal Government. During 1973, approximately 490 assays were paid for at a cost of \$2,785 to the Federal Government.

Mineral Claims Recorded

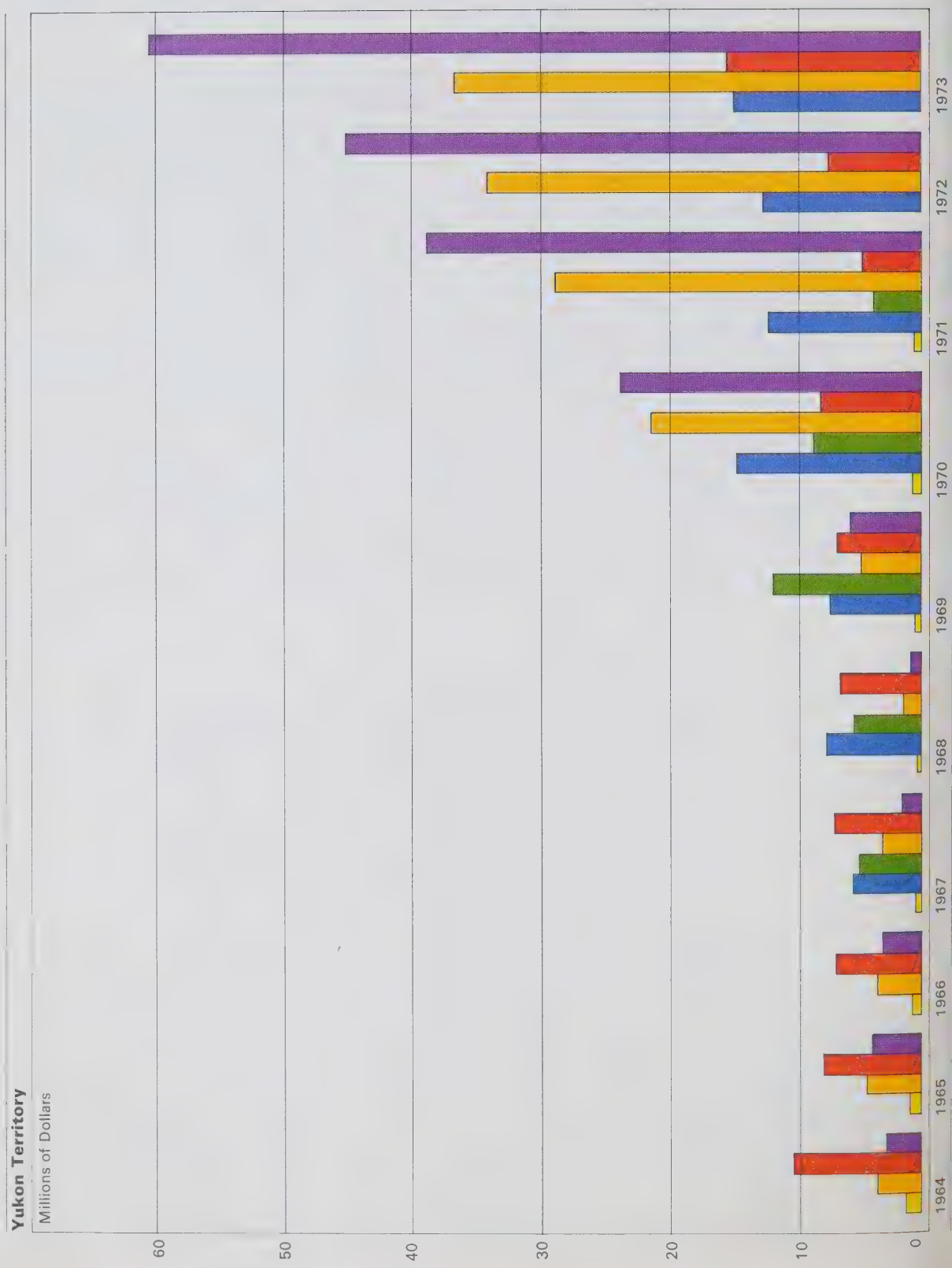
Value of Production



Mineral Production Chart 1964 to 1973

Northwest Territories										
Mineral	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973(a)
Cumulative Totals(b)										
Gold	\$ 15,586,182 ozs. 412,879	17,071,580 452,479	15,990,133 424,029	14,356,476 380,304	13,285,459 352,306	12,381,240 328,502	12,168,776 332,844	10,897,934 308,339	17,713,250 307,479	24,262,000 252,000
Silver	\$ 91,312 ozs. 65,223	1,490,754 1,064,824	2,325,407 1,662,192	3,429,755 1,980,228	8,677,365 3,751,563	3,910,888 2,032,367	5,114,587 2,764,642	4,574,616 2,932,446	6,778,965 4,059,261	13,801,000 5,520,000
Copper	\$ 354,342 lbs. 942,400	354,342 942,400	672,065 1,496,805	538,077 1,131,126	833,169 1,732,160	643,761 1,251,723	766,578 1,320,502	727,595 1,378,021	577,416 1,133,767	1,064,000 1,669,000
Nickel	\$ lbs.									
Lead	\$ 823,279 lbs. 6,125,588	25,677,695 165,662,547	31,472,562 210,659,720	35,665,535 254,753,820	33,636,984 250,275,180	32,299,014 212,913,740	37,842,405 239,206,099	22,629,795 167,628,110	27,838,277 180,439,960	35,853,000 222,136,000
Zinc	\$ 1,111,016 lbs. 7,840,620	28,596,474 189,380,626	57,128,344 378,333,400	60,852,900 419,964,800	57,504,129 407,830,700	68,275,481 448,296,000	76,004,563 477,115,900	75,056,384 448,633,500	64,792,006 339,741,000	89,741,000 374,544,000
Pitchblende (d)	\$ lbs.									
Cadmium	\$ 516,635 lbs. 185,840	516,635 185,840	2,769,372 1,073,400	2,551,920 911,400	774,060 271,600	675,136 191,800	737,632 207,200	301,476 155,400	205,436 81,200	56,000 15,000
Bismuth	\$ lbs.						3,072 490	41,149 7,578		
Tungsten	\$ lbs.									
Total	\$ 17,611,789	73,707,480	110,357,883	117,394,663	114,711,166	113,185,520	132,637,613	114,228,949	117,905,350	164,777,000
										1,367,605,007
Yukon Territory										
(c)										
Gold	\$ 2,183,611 ozs. 57,844	1,698,975 45,031	1,639,103 43,466	675,725 17,900	911,338 24,167	1,118,715 29,682	653,034 17,862	511,534 14,473	234,983 4,079	386,000 4,000
Silver	\$ 7,894,196 ozs. 5,638,712	6,462,393 4,615,995	5,868,217 4,194,580	6,701,756 3,869,374	4,806,384 2,077,987	5,182,166 2,685,060	7,845,312 4,240,709	8,966,417 5,747,703	8,331,575 4,988,967	15,391,000 6,156,000
Lead	\$ 2,744,235 lbs. 20,418,415	2,766,953 17,851,309	2,388,684 15,975,125	2,141,959 15,299,709	970,629 2,221,940	4,256,183 28,056,581	20,830,196 131,670,010	29,340,379 217,336,142	34,392,366 222,921,742	36,718,000 227,499,000
Copper	\$ 3,409,779 lbs. 98,150	3,409,779 98,150	5,097,157 46,390	7,645,623 15,791	5,097,157 46,390	7,645,623 15,791	9,148,995 83,008	2,709,696 21,026	890,286 1,748,093	13,771,000 21,587,000
Coal	\$ 98,150 tons 7,229	85,626 8,801	46,390 5,670	15,791 1,912		6,039	10,908			19,915
Zinc	\$ 1,855,512 lbs. 13,094,653	2,000,396 13,247,653	1,729,027 11,450,510	1,373,151 9,476,545	748,206 5,306,429	5,035,385 33,062,280	24,845,216 155,964,948	39,003,342 233,134,144	45,241,287 237,225,560	60,536,000 252,654,000
Cadmium	\$ 428,399 lbs. 132,222	386,192 138,918	306,336 118,735	265,997 94,999	147,716 51,830	239,985 68,172	261,528 73,463	114,654 59,100	82,759 32,711	55,000 15,000
Asbestos	\$ tons			406,371 2,260	8,684,125 63,592	11,924,526 87,437	13,927,652 105,638	12,374,380 91,969	13,006,476 101,888	14,849,000 99,000
Nickel	\$ lbs.									
Platinum	\$ ozs.									
Total	\$ 15,204,103	13,406,535	11,975,757	14,990,529	21,365,555	35,402,563	77,511,933	93,020,402	106,502,067	145,594,000
(a) Preliminary Figures										
(b) Cumulative Totals-1932 to December 31, 1973										
(c) Cumulative Totals-1886 to December 31, 1973										
(d) Figures for years 1932, 1943 to 1953 not available.										

Value of Mineral Production



Value of Mineral Production

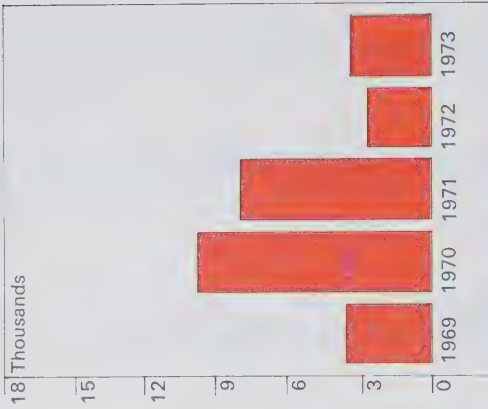


Mining Accident Severities

42

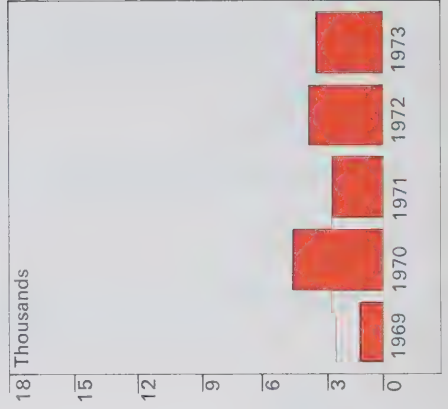
Northwest Territories

Mine	Number of Man-hours Worked 1973	Number of Days lost Jan-Dec. 1973	Accident Severity Jan-Dec. 1973	Accident Severity Jan-Dec. 1972
Arvik Mines Ltd.	48,371	8	165	
Canada Tungsten Mining Corp. Ltd.	207,447	188	906	546
Con-Rycon-Vol	418,276	689	1,647	2,134
Echo Bay Mines Ltd.	207,637	199	958	664
Giant Yellowknife Mines Ltd.	738,518	7,460	10,101	9,363
Pine Point Mines Ltd.	1,128,783	514	455	135
Terra Mining and Exploration Ltd.	154,811	126	813	1,110
Total	2,903,843	9,184	3,162	2,930



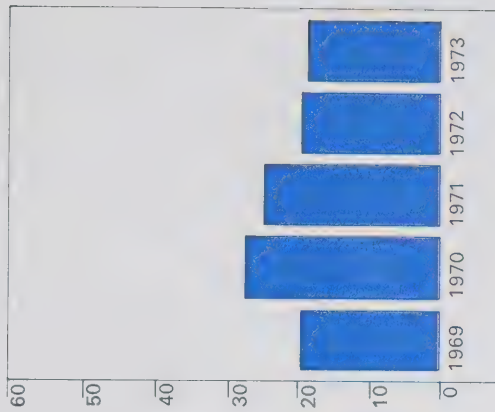
Yukon Territory

Mine	Number of Man-hours Worked 1973	Number of Days lost Jan-Dec. 1973	Accident Severity Jan-Dec. 1973	Accident Severity Jan-Dec. 1972
Anvil Mining Corp.	835,925	94	112	535
Cassiar Asbestos Corp.	648,438	213	328	152
Hudson-Yukon Mining Co. Ltd.	82,951	236	2,845	28,003
Whitehorse Copper Mines Ltd.	418,964	6,662	15,901	1,994
United Keno Hill Mines Ltd.	589,376	960	1,628	1,900
Tantalus Butte Mine	28,609	4	139	393
Total	2,604,263	8,169	3,136	3,217



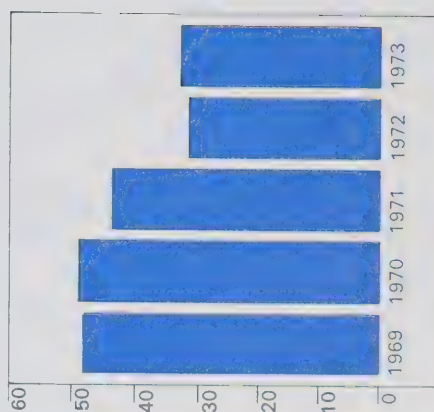
Northwest Territories

Mine	Number of Man-hours Worked 1973	Number of Accidents Jan-Dec. 1973	Accident Frequency Jan-Dec. 1973	Accident Frequency Jan-Dec. 1972
Arvik Mines Ltd.	48,371	3	6.20	
Canada Tungsten Mining Corp. Ltd.	207,447	4	19.28	23.75
Con-Rycon-Vol	418,276	13	31.08	9.52
Echo Bay Mines Ltd.	207,637	11	52.98	77.79
Giant Yellowknife Mines Ltd.	738,518	8	10.83	19.13
Pine Point Mines Ltd.	1,128,783	5	4.43	1.82
Terra Mining and Exploration Ltd.	154,811	13	83.97	53.32
Total	2,903,843	57	19.63	20.17



Yukon Territory

Mine	Number of Man-hours Worked 1973	Number of Accidents Jan-Dec. 1973	Accident Frequency Jan-Dec. 1973	Accident Frequency Jan-Dec. 1972
Anvil Mining Corp.	835,925	6	7.18	35.66
Cassiar Asbestos Corp.	648,438	5	7.71	2.62
Hudson-Yukon Mining Co. Ltd.	82,951	6	72.33	36.65
Whitehorse Copper Mines Ltd.	418,964	40	95.47	94.62
United Keno Hill Mines Ltd.	589,376	26	44.11	29.90
Tantalus Butte Mine	28,609	1	34.95	71.39
Total	2,604,263	84	32.25	31.41



Causes of Disabling Injuries in Mines

	Drilling	Caught between two objects	Strain while lifting	Fall of persons	Struck by moving object	Foreign matter in eyes	Tramming cars	Gassing	Fall of rock	Falling object	Blasting	Burns	Miscellaneous	Total
Northwest Territories														
Arvik Mines Ltd.			3											3
Canada Tungsten Mining Corp. Ltd.		1		2									1	4
Con - Rycon - Vol		1	2	2		1			2			2	3	13
Echo Bay Mines Ltd.		3		2		2			1			1	2	11
Giant Yellowknife Mines Ltd.		2	2	1		1				1			1	8
Pine Point Mines Ltd.					1							3	1	5
Terra Mining and Exploration Ltd.			2	4		1			1	3		2		13
Total		7	9	11	1	5			4	4		8	8	57

Yukon Territory														
Anvil Mining Corp.			1							2		2	1	6
Cassiar Asbestos Corp.				1	1							2	1	5
Hudson - Yukon Mining Co. Ltd.		1		2	1					1			1	6
Whitehorse Copper Mines Ltd.		3	7	11	1	2			3	2	2	4	5	40
United Keno Hill Mines Ltd.		3	5	10	3	1						2	2	26
Tantalus Butte Mine										1				1
Total		7	13	24	6	3			3	6	2	10	10	94

Appendix I

List of Publications

Mineral Industry Report 1969-70 Vol. 1 Yukon Territory and Southwestern Sector, District of Mackenzie, by D. B. Craig and P. LaPorte, 1972.

Mineral Industry Report 1969-70 Vol. 2, Northwest Territories east of 104° west longitude, by P. J. LaPorte, 1974.

Open File 129: Lake-sediment geochemical sampling survey in the following areas: Yellowknife, Indin Lake and portions of the Cameron River and Beaulieu River, Greenstone Belts by D. Nickerson, 1972; G.S.C. Open File 129.

Open File 135: Preliminary Geology map of Camsell River Silver District, scale five inches to one mile, by R. J. Shegelski and J. D. Murphy. Compilation geological map of Rainy Lake, N.T.S. area 86-E-9, scale ½ inch to one mile, by J. D. Murphy, 1973; G.S.C. Open File 135.

Open File 179: Preliminary Geology map of Rankin Inlet area, N.T.S. 55-K-16 at a scale of 1:31, 080 by P. J. LaPorte and S. K. Frape, 1973; G.S.C. Open File 179.

Papers

Copies of the following papers are available at the Resident Geologists' Offices or in Ottawa:

A Review of Mineral Exploration in the Keewatin District Northwest Territories by P. J. LaPorte, 1972. Presented at the Northwest Territories Chambers of Mines Exploration Symposium, Yellowknife, N.W.T. February 1972.

Northern Canada Mineral Exploration 1972 by P. J. LaPorte, W. A. Padgham, D. B. Craig. Paper presented at the Prospectors and Developers Association Convention, Toronto, Ontario, 1973.

Mineral Exploration North of 60°, Trend and Achievements by R. W. Hornal and D. B. Craig. Paper presented at the Prospectors and Developers Association Convention, Toronto, Ontario, 1971.

A Critical Review of Northern Mineral Potential by D. B. Craig and J. A. Kelly. Paper presented at the Prospectors and Developers Association Conventions, Toronto, Ontario, 1970.

Abstracts of the N.W.T. Chamber of Mines Exploration Symposium by Exploration and Geological Services, Yellowknife, N.W.T., February 1972.

Mineral Potential of the Northwest Territories by W. A. Padgham; published in the *Geology of Canadian Arctic*, Editors: J. D. Aitken, D. J. Glass: special publication by the C.S.P.G. and G.A.C., 1974.

Preliminary Studies

The following preliminary reports are on open file at the Resident Geologist's office in Yellowknife, N.W.T. and Whitehorse, Y.T.

1. Base Metal Sulphide Metallogeny in the Slave Structural Province, N.W.T., by W. Johnson, University of Western Ontario, 1973.

2. Preliminary Study on Metal Dispersion Patterns in Lake Sediments and the relationship to mineralization in the Yellowknife and Indin Lake areas, by R. G. Jackson, Exploration Geochemistry Group, Department of Geological Sciences, Queen's University, 1973.

3. Study of Coal in the Yukon by D. B. Craig and M. Milner, 1973.

4. Coal Deposits in the Arctic Archipelago, N.W.T. by T. W. Caine, 1973.

5. Soapstone Deposits of the N.W.T. by J. D. Murphy, 1973.

6. Mineral Occurrence Overlays for geological maps in the western District of Mackenzie, NTS 75, 76, 85, 86, parts of 77, 87, 95, 96 and 105, 1973.

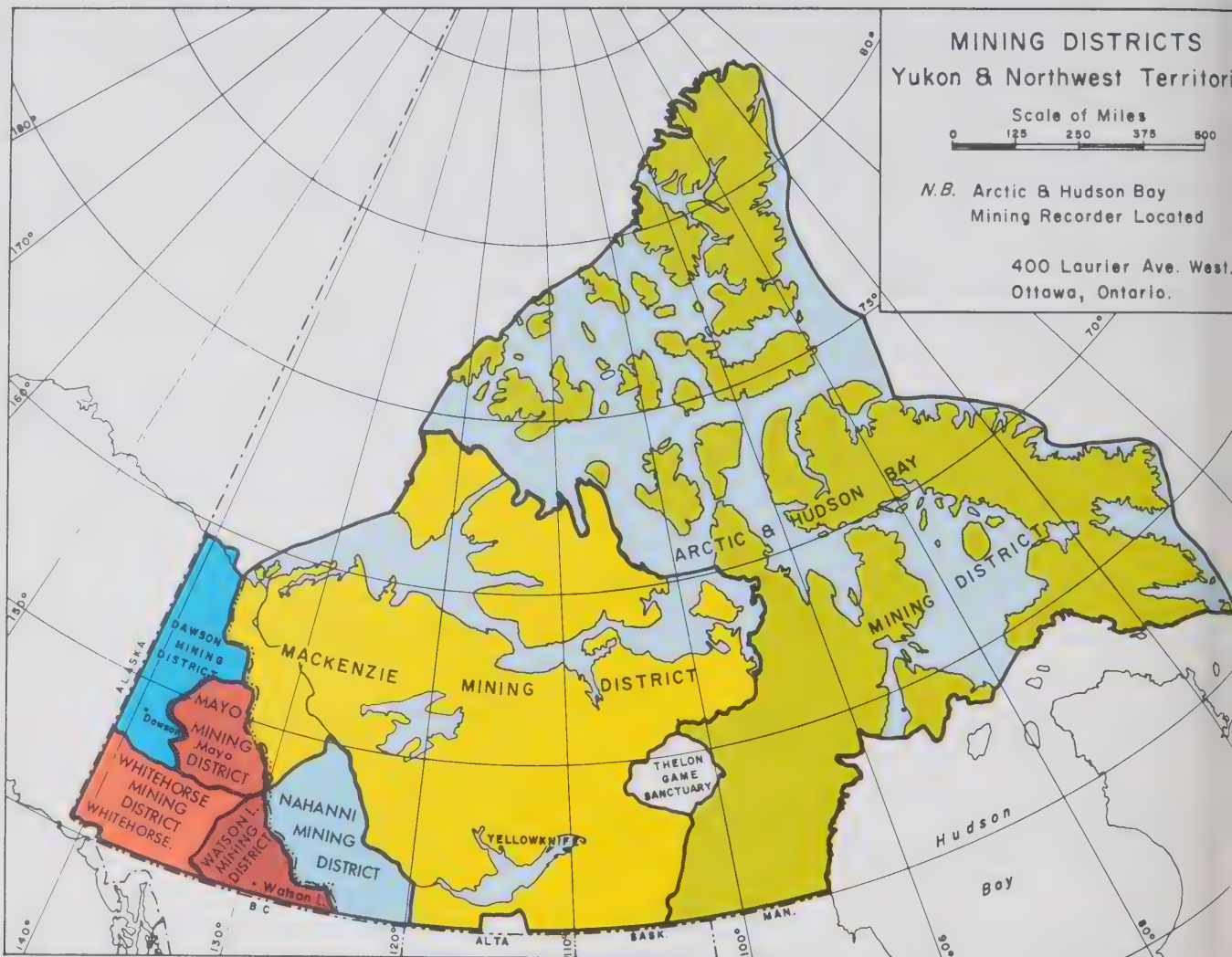
Serial Publications

1. North of 60, Mines and Minerals Activity (published yearly, reviews activity in Northern Canada for previous year; preliminary report available March of each publishing year). Available for 1971, 1972, and 1973.

2. North of 60, Mines and Minerals Statistics (published monthly to report claim and production information).

3. Index to confidential and non-confidential technical reports available in the Departmental offices in Whitehorse, Yellowknife and Ottawa.

4. Special geoscience computer indexes available for perusal in the Departmental offices in Whitehorse, Yellowknife and Ottawa.



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NORTH OF 60

Mines and Minerals Activities 1974

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Mining Section, Oil and Minerals Division
Northern Natural Resources and
Environment Branch
Department of Indian Affairs and Northern
Development

Issued under the authority of
The Hon. Judd Buchanan, MP, PC
Minister of Indian Affairs
and Northern Development



Thousands of Gold Rushers climb
Chilcut Pass in 1898.

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Introduction

The mining industry North of 60 in 1974 again played an important role in the development of Canada's northern territories in both its contribution to the local economies and by its increased production.

The industry contributed more than \$70 million to the economies of the Yukon and Northwest Territories. This money included salary and wages, payment for goods and services purchased locally, and payment of local taxes.

The mining industry also paid \$7,105,925.40 to the federal government last year in royalties on 1973 mining activities under the terms of the Canada Mining Regulations for the Northwest Territories and the Yukon Quartz Mining Act.

During the year, the value of mineral production in Canada's northern territories increased sharply. It was up 40 per cent to \$223,047,000 over 1973 in the Northwest Territories and up 23.3 per cent to \$185,041,000 in the Yukon.

Compared to 1960, the value of mineral production in the N.W.T. in 1974 represented a 1,238 per cent increase while the increase in the Yukon Territory during the 14-year period stood at 742 per cent. During the same period, the value of mineral production in Canada increased 470 per cent.

Production in the N.W.T. came from one open-pit and six underground mines which together produced lead, zinc, copper, gold, silver, cadmium and tungsten. The Yukon's production came from three underground mines and two open-pit mines which together produced lead, zinc, copper, silver, asbestos and coal. Lead-zinc accounted for 78 per cent of the total value of production in the N.W.T. and 61 per cent in the Yukon.

The Yukon was the largest producer of lead in Canada and the N.W.T. was second. The combined production of both territories was 396,073,000 pounds valued at \$81,987,000.

Production of gold, silver, copper and lead in the N.W.T. was lower than the previous year, though in all cases values were higher. Production of zinc and cadmium increased, with the latter up from 16,800 pounds to an estimated 40,000 pounds.

Gold and silver production was slightly increased in the Yukon. The production of lead, zinc, copper and asbestos was down, but again values were higher. According to the Mining Association of Canada, the mineral industry is the largest single employer and source of revenue in the Yukon Territory.

Mineral exploration expenditures in the N.W.T. in 1974 amounted to approximately \$18 million, up about 80 per cent from the previous year.

In addition, uranium exploration increased three-fold during the year in the N.W.T. Several large companies entered the Territories for the first time and once again prospectors from Uranium City, Fort Smith, Hay River and Yellowknife included geiger counters with their standard gear.

There were 12,180 mineral claims recorded in the N.W.T. in 1974. In addition, 39 prospecting permits were granted covering approximately seven million acres of mining land. This was an increase of 20 permits over 1973.

Due to the new base metal discoveries near Faro and Goz Creek, exploration expenditures in the Yukon Territory amounted to approximately \$12 million in 1974, an increase of \$2.7 million over the previous year.

There were 13,696 claims recorded in the Yukon, an increase of 4,313 over 1973.

The most promising developments in the Yukon include:

highly encouraging signs for the future such as the newly-drilled extension of the Vangorda mineral deposit (105K6, 62° 16'N, 133° 13'W) of Kerr Addison Mines Limited and AEX Minerals Corporation (76), the large tungsten deposit in the MacMillan Pass area, the lead-zinc deposit near Summit Lake, and indications of high-grade zinc mineralization in the Bonnet Plume area.

In the Minto area, 27,029 feet of diamond drilling on the DEF claim group (115 I 11, 62°38'N, 137°15'W) 12 miles west of Minto (73)* by United Keno Exploration, a consortium representing Canadian Superior Exploration Limited, Falconbridge Nickel Mines Limited and United Keno Hill Mines Limited. On the adjoining MINTO claims (115 I 11, 62°36'N, 137°15'W) to the south, jointly owned by Asarco Exploration Company of Canada Limited and Silver Standard Mines Limited, Asarco carried out 36,838 feet of diamond drilling. Much of this drilling was centred on the orebody which straddles the boundary between the two properties.

The most promising developments in the N.W.T. include:

the discovery of a third "ore" zone the "Boot Lake Zone" on the Bathurst Norsemes Ltd. property on the Hackett River by Cominco Ltd.

the drilling by the Yava Syndicate (Conwest Exploration Co. Ltd., Dr. S. Roscoe and Brascan Resources Ltd.) of a lead-zinc body 25 miles southeast of the Bathurst Norsemes deposits at H Lake.

the discovery by Texasgulf Inc. of a copper deposit east of Takiyuak Lake.

the discovery by Rio Tinto Canadian Exploration Ltd., Serem Ltd. and Welcome North Mines Ltd. of long mineralized units within Paleozoic formations (mainly the Sekwi Formation) north and east of the Bonnet Plume discovery of Barrier Reef.

the discovery, by drilling, by Gemex Minerals Ltd. of a copper-zinc body at Heninga Lake in the Keewatin District.

**Numbers in parentheses throughout the book refer to location of activity areas on the accompanying mineral exploration and mining map.*

the canoe, pack horse and dog team has been,
more or less, replaced by the helicopter to get
prospectors into inaccessible areas.



Arthur Harper, one of the first prospectors to work in Canada's northern territories, came to the Yukon in 1872 to search for placer gold.



Fred Hart, one of Harper's close friends, accompanied him on many prospecting ventures.



Honouring our Prospectors

A. H. Lang, in *Prospecting in Canada*, (Geological Survey of Canada, Department of Energy, Mines and Resources, Ottawa, 1972) describes the art of prospecting from the early cave man to modern-day technologists. In Canada, he states, "the early prospectors were to a large extent travelling untrodden paths where the more obvious occurrences awaited discovery. Their outstanding characteristics were their ability to travel and live under pioneer conditions, buoyant optimism, dogged perseverance, and open-handed hospitality". Pioneer prospectors Arthur Harper and Fred Hart in 1872 were living examples of the special breed of men Lang describes, and were the first of a number of early prospectors to work that part of Canada known as North of 60°. The Yukon Territory and the Northwest Territories make up more than 40 per cent of the Canadian land mass and their mineral resources are just beginning to be explored.

Over the last 100 years, it has been the prospector who has had the faith, tenacity and foresight to continue the search for mineral deposits in the North while geologists and mining companies were looking elsewhere. Most of the twelve producing open-pit and underground mines and the numerous small placer mining operations in the North today were located by prospectors. Only in the cases of the Pine Point and Anvil areas were hidden mineral deposits missed by surface prospecting, left to be discovered later by geophysical surveys. The prospector's faith has been justified, as mineral production value from Canada's north reached \$408,088,000 in 1974.

After the arrival of Harper and Hart in the Yukon Territory, in the 1870's, a trickle of prospector-miner-trappers came searching for placer gold and, by 1896, placer-mining was well established in the 40 Mile area and on the Stewart and Lewis (Yukon) rivers. Robert Henderson first found gold in the Klondike district but it was George Washington Carmack and his Indian companions, Skookum Jim and Tagish Charlie, who staked Rabbit Creek (renamed Bonanza Creek at a miners' meeting) and started the fabulous Klondike Gold Rush.

Attracted by gold to the Klondike, prospectors found and worked placer gold in the 60 Mile area, the Mayo District, and the Kluane Lake District. This attraction has recently been revived because of the substantial increase in the price of gold. Many placer

gold prospectors searched for other minerals on their way to the Klondike. In 1898, a group of prospectors going to the Klondike via the overland route, north from Edmonton, found and staked the lead-zinc showings at Pine Point, N.W.T.

Sixty-six years later, in 1964, Pine Point Mines began production and started a staking rush which peaked the following year when the railhead reached the Pine Point area. Pyramid Mining Co. Ltd., by finding a new lead-zinc orebody, gave impetus to the Pine Point staking rush in the 1965–67 period.

Following the gold rush, hardrock prospecting and mining in the Yukon centred on the Whitehorse Copper Belt, the copper prospects in the White River area, the silver-gold-lead prospect in the Montana Mountain area and the antimony and gold prospects in the Wheaton River country. Discoveries made by H.W. McWhorter in 1906 and prospector Louis Beauvette in 1918 created prospecting interest and a staking rush in the Keno Hill area where mining is continuing today.

In the 1920's, prospecting in both the Yukon and Northwest Territories entered a new phase with the introduction of the airplane, which allowed prospectors easy access to previously hard to reach areas. A prospector from the Cyril Knight Prospecting Company located the copper-nickel mineralization on the west side of Hudson Bay which eventually became the Rankin Inlet Nickel Mines. Great Bear Lake was the scene of a staking rush in 1930–31 following the Gilbert Labine and E.C. St. Paul discovery of radium-bearing veins at Port Radium on Great Bear Lake. Later, it became Eldorado Gold Mines Limited — Canada's first radium mine. The mine closed in 1940. However, it was soon re-opened to provide the urgently needed uranium used in the world's first atomic bomb. In 1944, the Crown-owned Eldorado Mining and Refining Co. Ltd. took over operation of the mine. It is interesting to note that Echo Bay Mines Ltd. is now re-opening the old Eldorado shaft to recover silver-bearing veins left in the upper levels when the mine was producing uranium.

In 1935, prospectors working for the Consolidated Mining and Smelting Company staked gold claims in the Yellowknife area. From these claims the Con

George Washington Carmack, after whom the village of Carmacks in the Yukon is named, started the fabulous Klondike Gold Rush by staking Bonanza Creek claims in 1896.



Gilbert Labine, along with E. C. St. Paul, discovered radium-bearing veins at Great Bear Lake, N.W.T. in 1930. Development of his find led to Canada's first radium-uranium mine and the world's first atomic bomb.

Tom Payne in 1936 staked claims which are now part of the Con Mine operations at Yellowknife.



Mine developed. Subsequent staking rushes before and after World War II giving prospectors a new interest in the gold potential of the Northwest Territories.

Since the Second World War, mining engineers and geologists have become more involved in the direct search for mineral deposits. The failure to find new near-surface mineral occurrences has led to development of geophysical methods of mineral detection. Dependency on these new methods means the prospector must continually acquire new technical skills. Indeed, the increasing need for technical and geological skills in mining exploration today is strengthening the bond between geologists, engineers and prospectors.

In the last few years, some prospectors have had the thrill of seeing their discoveries develop into mines. Some of these prospectors include Al Kulan, Tom Payne, Gordon Latham, Allen Berglund, Hugo Brodell, Carl Sutton, Art Anderson, Pete Verslucce, Wally Green, Noel Avadluk and Gilbert LaBine.

A number of mining professionals have also directed their energies towards prospecting. Some of these include R. E. "Dutch" Van Tassel, Aaro Aho, Gordon Davis, John Brock, Doug Wilmot, J.F. Allan, Len White and Murray Watts.

What is the prospector's role in today's exploration industry with so many new methods — such as airborne and ground geophysical surveys, geochemical surveys, and even a biogeochemical air trace method which together help the geologists and engineers locate new mineral discoveries? In many cases, the anomaly found by the new methods must be followed up by detailed surface examination. Here — experience has proven — the prospector is still the most efficient performer. In the North the prospector's search is still essential, for often he moves into new areas where others will not venture.

There have been many prospectors who have worked the North since Hart and Harper began prospecting in the Yukon. Some of them have been forgotten because of their isolated life style and the passing of time. However, it has been possible through official documents, old reports and, in many cases, personal contact, to identify most of the prospectors who have worked the North. Some of the northern prospectors are featured throughout this report.



Mining Production

Production in 1974 came from one open-pit and six underground operations producing lead, zinc, copper, gold, silver, cadmium and tungsten. Lead-zinc accounted for 78 per cent of the total value of production, with the N.W.T. again being the second largest lead producer in Canada. Total value of mineral production in the Northwest Territories was \$223,047,000, up 40 per cent over 1973.

Lead-Zinc

Pine Point Mines Ltd.

Tonnage was up from 1973 while grade was down, resulting in nearly the same production value. Nine open pits provided the ore.

As the average hauling distance increases, additional large equipment and larger crews are becoming necessary.

The M-40 orebody was worked from underground. Plans were underway to increase the flow of ore from M-40 and other deep orebodies. This will lead to the use of more equipment, additional employees, and an increase in the size of the townsite.

Pine Point Mines Ltd.

Type:	Open-pit
Location:	South shore of Great Slave Lake, 50 miles east of Hay River, N.W.T.
Product:	zinc and lead
Rate:	11,513 tons per day
Total Tons Milled:	4,135,380
Reserve Grade:	Eight per cent combined lead-zinc
Reserves:	38,300,000 tons
Employees:	587

Gold

Con Mine-Cominco Ltd.

Tonnage was down due to labour shortages and turnover, but grade improved over 1973. A subsequent substantial increase in wages may improve the labour situation.

The new Robertson Shaft was at the 2,400-foot level. Target date for completion of the 5,800-foot shaft is early 1976. At 1,600 feet the shaft intersected a quartz vein that contained some gold values. A station was cut at 2,300 feet to expedite investigation of this zone.

The Con Mine won the Ryan Trophy from the Canadian Institute of Mining and Metallurgy in 1974, for being the safest mine in the Prairie Provinces and N.W.T. Region.

Con Mine (Cominco Ltd.)

Type:	Underground
Location:	1.5 miles south of Yellowknife
Product:	gold
Rate:	398 tons per day
Total Tons Milled:	145,205
Reserve Grade:	0.50 ounces per ton
Reserves:	1,200,000 tons
Employees:	214

Giant Yellowknife Mines Ltd.

Tonnage and grade were both well below 1973 levels. The open-pit mine near the south end of the property produced 400 tons per day. This zone is reported to contain half a million tons of ore grading 0.3 ounces per ton to a depth of 350 feet. Waste stripping began in March and ore was first produced in August.

Giant Yellowknife Mines Ltd.

Type:	Underground
Location:	1.5 miles north of Yellowknife
Product:	gold
Rate:	899 tons per day (including ore from adjoining Supercrest and Lolor properties)
Total Tons Milled:	328,099
Reserve Grade:	0.33 ounces per ton
Reserves:	2,400,000 tons
Employees:	326

Silver-Copper

Echo Bay Mines Ltd.

The mine ran out of ore in 1974. For the first 10 months the mine averaged 90 tons per day grading more than 100 ounces of silver per ton, giving a total of more than two million ounces. The mill closed in August. One stope was being mined above the adit level.

The company moved its hoist back to the old Eldorado mine and proceeded to de-water the mine to the 850-foot level. This was followed by an exploration and development program to mine silver ore left on closure of the former uranium producer.

***Echo Bay Mines Ltd.**

Type:	Underground
Location:	Great Bear Lake
Product:	silver-copper
Rate:	91 tons per day
Total Tons Milled:	20,658
Reserve Grade:	100 ounces of silver per ton
Reserves:	Not Known
Employees:	69

*Mill closed August 16, 1974.

Terra Mining and Exploration Ltd.

Tonnage was up from 1973 while grade and silver production were down. However, grade has been improving as the richer ore from the No. 10 vein reached the mill.

The new veins gave the mine ore reserves for the first time since start-up in September, 1969. The company was confident that it could trace the veins continuously from the fifth level to the surface.

Some work was done on the adit at Norex, but little progress was made before freeze-up, with no ore being encountered. Labour problems and management discontinuity have hampered production.

Terra Mining and Exploration Ltd.

Type:	Underground
Location:	10 miles south of Great Bear Lake
Product:	silver-bismuth-copper
Rate:	137 tons per day
Total Tons Milled:	46,234
Reserve Grade:	Not Known
Reserves:	Not Available
Employees:	53

Tungsten-Copper**Canada Tungsten Mining Corporation Ltd.**

The open-pit shut down permanently in the autumn of 1973 with the remaining ore being milled by May. Since underground ore has a better grade and is easier to mill, there was no loss of production when the company switched to the underground operation.

Canadian Mine Services did the underground development work on contract. There were numerous mechanical problems to be solved.

The company began a townsite, plant and mill improvement and expansion program. Due to a labour shortage, the program was behind schedule by year-end.

Canada Tungsten Mining Corporation Ltd.

Type:	Underground
Location:	125 miles north of Watson Lake, Yukon Territory
Product:	tungsten-copper
Rate:	465 tons per day
Total Tons Milled:	170,019
Reserve Grade:	1.68 per cent tungsten trioxide and 0.22 per cent copper
Reserves:	4,242,000 tons (underground)
Employees:	104

Silver**Hope Bay Mines Ltd.**

Crews rehabilitated the mine and built a small mill during the year. Mining proceeded on the high-grade vein opened last year. The mill operated at 14 tons per day during August and closed in September. The company reported 65,000 ounces of silver produced from 850 tons milled.

Developing Properties

Arvik Mines Limited owned by *Cominco Ltd.* (75 per cent) and *Bankeno Mines Limited* (25 per cent) continued diamond drilling at the mine and in neighbouring areas. The company has reserves of 25 million tons of 20 per cent combined zinc-lead. In September, 1973, a 3,700-ton bulk sample of ore was shipped from the property for metallurgical testing. Economic feasibility studies were underway at year's end.

Nanisivik Mines Limited has started on the mill foundation and a crew began an 8,000-foot underground development program on its 6.97 million ton orebody. Reserves grade 14.1 per cent zinc, 1.4 per cent lead and 1.8 ounces silver per ton. The federal government obtained a minority share position (18 per cent) in the company.

Mineral Exploration

In 1974, an estimated \$18 million was spent on mineral exploration in the Northwest Territories. These funds have been divided between the search for base metals, the search for uranium and the examination of gold and silver properties. During the year, 12,180 claims were staked and 39 new prospecting permits were issued to bring the total claims in good standing to 49,000 and the number of prospecting permits in good standing to 67.

Prospector puts up last cache of season at
Pensive Lake, NWT in 1939.



Lead-Zinc

Arctic Islands

Great Plains Development Company of Canada Ltd., in partnership with *Texasgulf Inc.* and *Brinex*, conducted gravity and IP surveys as well as a geological mapping and prospecting program over a lead-zinc discovery on Judge Daly Promontory, on northern Ellesmere Island (5).

Also on Ellesmere Island, *Kapvik Exploration Ltd.*, a syndicate managed by *Barrier Reef Resources Ltd.*, prospected for lead and zinc showings in the Lower Paleozoic formations.

Cominco Ltd. conducted a general prospecting program over many of the Queen Elizabeth Islands, Somerset Island and Prince of Wales Island. *Cominco* also drilled lead-zinc targets on Truro Island (6), on Little Cornwallis Island (7), in the vicinity of its Eclipse showing, on Cornwallis Island (8), Rookery Creek showing, and on the Sheills Peninsula on Devon Island (9).

Canadian Superior Exploration Ltd., in partnership with *Home Oil Ltd.* and *Brinex*, continued with geophysical surveys, geological mapping and drilling on five permits on Cornwallis Island.

Nanisivik Mines Ltd. drilled six holes and conducted a VLF-EM survey in the Hawker Creek area (10), east of its Strathcona Sound deposit on Baffin Island, to test massive sulphide mineralization revealed by geochemistry and trenching.

Keewatin District

Selco Mining Corp. Ltd., working from Munro Lake and Virginia Lake (11), conducted ground geophysical and geological surveys and drilled four holes totalling about 1,000 feet on anomalies detected during an airborne survey in 1973.

Noranda Exploration Ltd. conducted ground geophysical surveys, geological mapping and diamond drilling on its permit and claims in the Heninga Lake area (4) to explore a sulphide facies iron formation east of Heninga Lake. *Noranda* also mapped and flew the area between Kaminak and Quartzite Lakes (12). Some claims were staked and some preliminary ground geophysical work was completed on these claim groups.

Aquitaine Company of Canada Ltd. continued work on its four permits southeast of Eskimo Point (13) and acquired two new permits (55 E/3,6). *Questor Ltd.* flew an electromagnetic and magnetic survey over the new permits in early summer. *Geoterrex Ltd.* conducted ground geophysical surveys over anomalies identified during the 1973 airborne work. A total of 6,000 feet in 16 holes was drilled to test 12 anomalies. Minor sulphide concentrations were encountered in a few holes.

Phelps Dodge Corp. of Canada Ltd. conducted ground geophysical surveys on claim groups near Rochon Lake and Snowbird Lake (15) near the Keewatin-Mackenzie border.

Great Slave Lake — Great Bear Lake Area
Rayrock Mines Ltd., late in the season, began a 2,000-foot drilling program on a lead-zinc showing on Keith Island (KEN claims) in the East Arm of Great Slave Lake (18). As drilling was not completed by early November, the program will be continued in 1975.

Initiative Explorations Ltd., in partnership with *Indian Mountain Metal Mines Ltd.*, conducted a VLF-EM survey and a magnetometer survey over the DALE claim group on the west side of Brislane Lake (22). At least 14 holes, totalling more than 5,000 feet, were drilled on the best conductors. Some interesting mineralization was encountered.

Clinton-Colden Lake — Bathurst Inlet Area
Cominco Ltd. mounted a sizeable program on the *Bathurst Norsemix Ltd.* Hackett River property (1) which included gravity and EM surveys, mapping and diamond drilling of the Boot Lake zone, the Anchor Lake zone and one metallurgical test hole on the Cleaver Lake zone. Drilling indicates that the Boot Lake zone is at least 600 feet long, up to 100 feet wide, extends down to at least 700 feet, and contains several million tons of silver-zinc mineralization. *Cominco Ltd.* also prospected, staked, and mapped in the Back River area (23), the High Lake area (24), the Point Lake area (25) and elsewhere.

Sam Otto prospected in the N.W.T. in the 1930-50 period.

Wilf McKinnon prospected in both the Yukon and N.W.T. after World War II. Many of the showings he found are under development today.

Bill Johnson prospected, often with Otto, in the N.W.T.

Prospector Mike Mitto staked gold showings at Matthews Lake, north of MacKay Lake, N.W.T. in the late 1940's. The property is now being evaluated by Giant Yellowknife Mines Ltd.



Texasgulf Inc. drilled the Canoe Lake showing (24) of *Oakwood Petroleums Ltd.*, a gossan containing intermittent high values of lead and zinc. The company also staked claims in the High Lake area.

Noranda Exploration Ltd. optioned the CC claims on Clinton-Colden Lake (26) from *Windflower Mines Ltd.*, and conducted airborne and ground geophysical surveys, geological mapping and a small diamond drilling program on the lead-zinc showing. The results were generally disappointing. *Noranda* also prospected, mapped and staked claims in the area between the Hackett River (1) and Regan Lake (23). Claims were also staked in the High Lake area (24), the Hood River area (27) and east of Takiyuak Lake (2).

Great Plains Development Co. of Canada Ltd. optioned a lead prospect at Bathurst Inlet (28).

The *Yava Syndicate (Brascan Resources Ltd., Con-west Exploration Co. Ltd. and Dr. S. Roscoe)* staked and drill-tested a geochemical anomaly (1) identified in 1972 and studied in 1973 by the Geological Survey of Canada. Based on geophysical and drilling information, the zone has a strike length of 600 feet and true widths of up to 100 feet and is open to depth. Indicated grade is in the order of three per cent zinc, 0.5 per cent lead, 0.5 per cent copper, three ounces of silver per ton and 0.03 ounces of gold per ton. The Yava claims cover much favourable ground containing many gossan zones and geophysical anomalies which remain to be tested.

Mackenzie Mountains

The western portion of the Northwest Territories continued to be of great interest to many companies. Lead and zinc discoveries at Summit Lake (31), Godlin Lakes (32), Goz Creek (in the Yukon), Wrigley (33) and on the Arctic Red River (3) were investigated or staked during the year. Much work will be required to evaluate the size and nature of these deposits and the Mackenzie Mountains should continue to interest mining companies in 1975 and in subsequent years.

In the Wrigley area (33), *Cominco Ltd.* continued its work on its permit acquired in 1972. Up to four drills were working on these showings in 1974. On permits to the north of Cominco's showing, *Giant Yellowknife Mines Ltd.* (33) conducted a detailed sampling program and identified an interesting occurrence of smithsonite and galena in the Bear Rock Formation on the east side of the Mackenzie River. Attempts to drill the showing were thwarted by an early freeze-up but the program will continue next year.

Giant Yellowknife Mines Ltd. had a crew prospecting for lead and zinc mineralization in the Nahanni Formation south of Cominco's ground on permits optioned from *Union Oil Co. of Canada Ltd.* (33).

Cadillac Explorations Ltd. reoccupied its camp on Prairie Creek (34), refurbished the camp buildings and the roads and did additional trenching on its southern showings.

Vieco Resources Ltd. and *Whipsaw Resources Ltd.* optioned the RAM, ROD and TAM groups (35), 100 miles north of Watson Lake. *Getty Mines Ltd.* previously delineated silver-lead-zinc mineralization in veins near a quartz monzonite stock.

Canex Placer Ltd., had one drill at work all summer in the Summit Lake area (31) to further define the stratigraphy and the mineralized horizons.

Dynasty Exploration Ltd. trenched and drilled its PAS claims in the Summit Lake area (31) and conducted geological and geochemical surveys, and a drill program of four holes on its SAND and GUN claim groups, 35 miles to the northeast.

Imperial Oil Ltd. conducted a soil and silt geochemical survey and a magnetometer survey over the ALPHA, BRAVO, ECHO, CHAR and DELTA claim groups south of *Canex Placer's* ground.

Quintana Minerals Corp. prospected and did follow-up geochemistry over a geochemical anomaly in the Sunblood Formation on the NANCY claims some 25 miles east of *Canex Placer's* ground.

Cominco Ltd. conducted a prospecting and reconnaissance sampling program over a large area of the Backbone Ranges of the Mackenzie Mountains which resulted in the staking of several claim groups near the headwaters of the North Nahanni River (36).

In the Godlin Lakes area (32), several programs were completed on ground originally held by *Welcome North Mines Ltd.*

Welcome North Mines Ltd. conducted sampling and mapping programs on the PAM and HORSESHOE claims.

Amax Exploration Inc. optioned the DICK, RAIN, RAK, REEF, and TAP groups. Geological mapping, trenching and diamond drilling disclosed mineralization associated with pyrite veinlets within the Sunblood Formation and mineralization as stratiform disseminated lead and zinc sulphides within the Whittaker Formation.

Cominco Ltd. continued its drilling program on the optioned BEAR-TWIT claim group. A total of four holes tested brecciated dolomites of the Whittaker Formation and the Delorme Formation.

Bethlehem Copper Corp. Ltd. continued drilling on the TET, RAP, ARN and DEE groups and prospected in the general area.

Sicintine Mines Ltd. prospected, mapped and ran a geochemical survey over parts of the optioned TEE group.

Geomont Exploration Ltd. geologically mapped and prospected the ICE and EMILY groups for lead and zinc and the NITE group for copper. Two holes drilled on the NITE group and one hole drilled on the ICE group intersected no significant mineralization.

Malabar Silver Mines Ltd. drilled four holes to test four surface showings in skree slopes on the ART-EKWI claim groups. The best intersections ran 43 per cent zinc over 11.5 feet, and 24.5 per cent zinc and 4.5 per cent lead over 21.5 feet.

Perry River Nickel Mines Ltd. holds a considerable amount of ground in the Godlin Lakes area. This summer it conducted a geochemical survey on the BB group with *Dyke Mines Ltd.* and a prospecting, geological mapping and geochemical program on the DAY, NOON and BOB groups with *Savanna Resources Ltd.* and *Jomial Investments Ltd.*

In the Mountain River area (38) north of Godlin Lakes, *Noranda Exploration Ltd.* examined lead and zinc showings in barite veins on the CONE group.

Welcome North Mines Ltd., operator for the Arctic Red Project, a consortium consisting of *Utah Mines Ltd.*, *Bethlehem Copper Corp. Ltd.*, *Dupont of Canada Ltd.*, *International Mogul Mining Ltd.* and *Welcome North Mines Ltd.* prospected, staked and geologically mapped large areas of Lower Paleozoic and Upper Hadrynian rocks 40 miles north of the Goz Creek area near the source waters of the Arctic Red and Snake rivers (3). Several long zones of bedded lead and zinc mineralization have been identified and staked. The mineralization is concentrated in the Sekwi Formation and Mount Kindle Formation. The showings on the AB and CAB groups were drilled in late 1974.

Rio Tinto Canadian Exploration Ltd. and *Serem Ltd.* also staked a large block of claims over what is believed to be similar geology on the Gayna River (3) and to the north and west of the Mountain River (38).

In the Richardson Mountains (39), *Texasgulf Inc.*, *Noranda Exploration Ltd.* and *Amoco Canada Ltd.* prospected the Lower Cambrian carbonates for lead and zinc mineralization.

Cominco Ltd. geologically mapped, sampled and trenched a lead-zinc showing in shales of the Road River Formation on its KEELE claims northwest of O'Grady Lakes (40).

Trident Resources Ltd. mapped and sampled its EKI claims northeast of the O'Grady Lakes (40) where minor lead, zinc and copper are present within dolomite of the Sekwi Formation.

Copper

Keewatin District

Gemex Minerals Ltd. conducted a horizontal loop EM survey and a Turam survey over water-covered portions of the SKIM claims on Heninga Lake (4) and then drilled six holes on a previously defined conductor. The first hole cut a 34.5-foot section assaying 2.91 per cent copper, 6.84 per cent zinc, 3.09 ounces per ton silver and minor lead. The other holes returned similar values over similar widths. *Gemex Minerals Ltd.* has optioned the property to *St. Joseph Explorations Ltd.*, and additional work is now being planned.

Great Slave Lake — Great Bear Lake Area
Seaforth Mines Ltd. drilled five holes totalling 2,030 feet on the MJ claim group between Clut Lake and the *Norex* silver property (16) to investigate widespread but erratic copper mineralization. The better mineralization is associated with pyroclastic beds interstratified with porphyritic andesite flows.

Nor-Can Minerals Ltd. trenched, mapped and conducted limited geophysical surveys over copper occurrences near the mouth of the Thubun River (17). The best showings were drilled.

Mission Mining Ltd. drilled a copper-silver showing on the ED claims on the south shore of Great Slave Lake across from Preble Island (17). Results were inconclusive.

Cleaver Lake Mines Ltd. drilled one hole on the BAY claims northeast of Horner Lake (19) on a geophysical conductor identified in 1971. Results were disappointing.

Cleaver Lake Mines Ltd. also conducted a soil geochemical survey over claims staked over volcanics north of Muskox Lake (20).

Great Plains Development Co. of Canada Ltd. conducted horizontal loop EM and magnetometer surveys over a gossan zone which was known to contain up to 0.8 per cent copper on the SAM group on the Cameron River (19) northeast of Gordon Lake.

Great Plains Development Co. of Canada Ltd. also conducted an IP survey over the BBX claim group, a copper property at Taltheilei Narrows (21). Drilling is planned in 1975.

A Yellowknife prospector, *Mr. Bill Rossing*, reported the discovery of chalcopyrite mineralization in a zone which is adjacent and parallel to a diabase dike on the north shore of the East Arm of Great Slave Lake (21). Preliminary sampling gave assays up to 1.8 per cent copper.

Great Plains Development Co. of Canada Ltd. prospected and mapped several claim groups on the west side of Brislane Lake (22) to identify targets for ground geophysics and possible drilling.

Clinton-Colden Lake — Bathurst Inlet Area
The hottest exploration area this summer in the Precambrian area of the Northwest Territories was the northeastern Slave Province between Clinton-Colden Lake and the Arctic coast. *Cominco Ltd.*, *Texasgulf Inc.*, *Noranda Exploration Ltd.*, *Dupont of Canada Ltd.*, *Uranerz Canada Ltd.*, *Kennco Explorations (Western) Ltd.*, *Long Lac Mineral Explorations Ltd.* and *Great Plains Development Co. of Canada Ltd.* conducted grassroots exploration programs in this area. *Noranda Exploration Ltd.* flew portions of the area and several companies are planning aerial geophysical surveys next summer. The targets are copper-zinc and zinc-silver bodies. In the latter type of occurrence, copper may be present as a major constituent of the footwall zone. Potential for precious metals also exists (eg. *Inco's* Contwoyto Lake gold deposit, *Hope Bay Mines Ltd.* silver deposit and *Arcadia Explorations Ltd.* gold deposit).

Texasgulf Inc., through *Ecstall Mining Ltd.*, its wholly-owned subsidiary, continued work on its permit area on the east shore of Takiyuak Lake (2). Geological and geophysical programs were completed over several anomalies indicated by aerial geophysics and ground prospecting in 1973. A drill program tested several conductors, the best results gave an average intersection of 34 feet in five drill holes which assayed 4.47 per cent copper, 1.3 ounces per ton silver, 4.83 per cent zinc with minor lead and gold.

Dupont of Canada Ltd. prospected and mapped portions of its permit centred on Casey Lake (23). Some ground geophysical surveys were conducted. The company also prospected and staked in the Back River area and elsewhere.

Uranerz Canada Ltd. worked in the Bathurst Inlet area (28). Primarily, the company looked for uranium, but also examined the copper potential of Coppermine River basalt flows and the basic dikes and sills in this area.

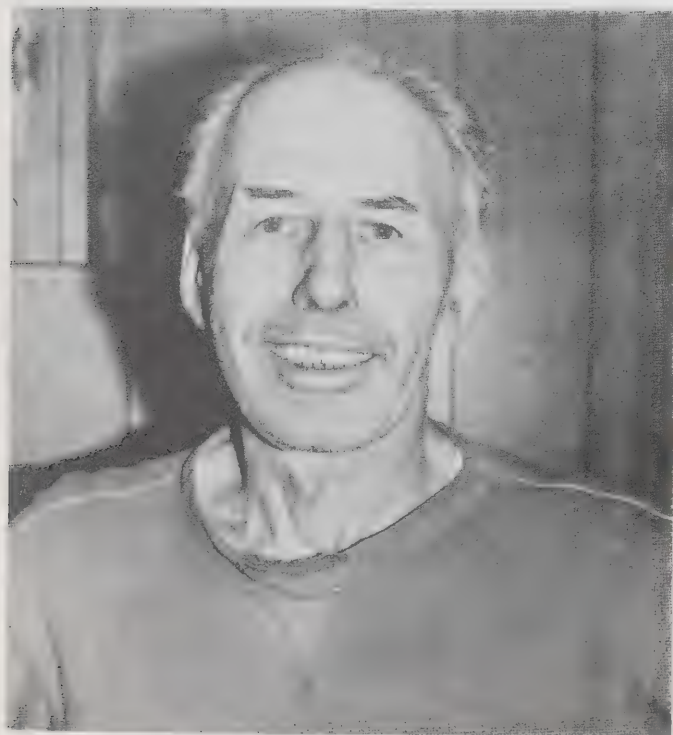
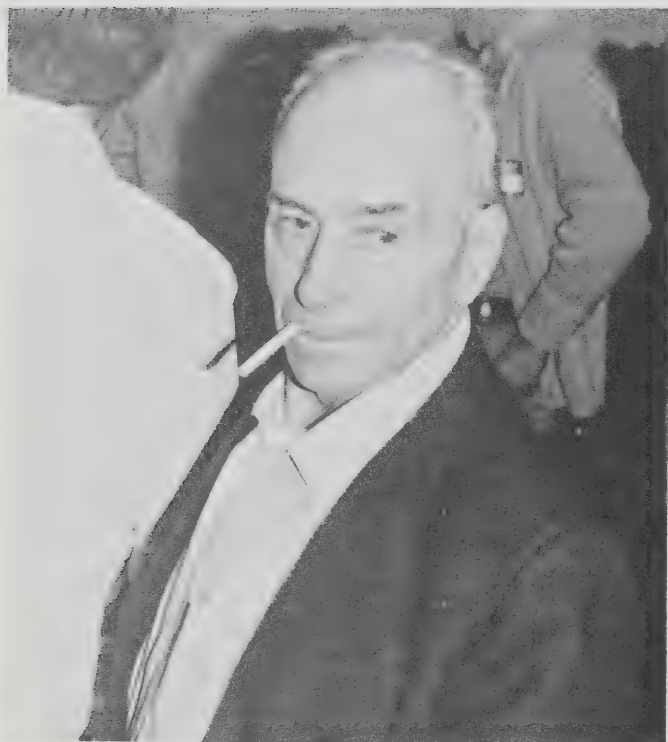
Kennco Explorations (Western) Ltd. conducted geochemical sampling and prospecting in the area surrounding, and west of, its High Lake copper-zinc deposit (24). Several claim groups were staked.

Long Lac Mineral Explorations Ltd. mapped and prospected two permit areas lying between Hood River and Contwoyto Lake (76 L/4, L/10) and staked a few claims in the adjacent territory (29).

Pete Verslucce recognized the potential of the Yukon's Little Chief claim which is now the main source of ore for the Whitehorse Copper Mines.

Harry Verslucce, Pete's brother, accompanied him on many prospecting ventures throughout the Yukon over the last 30 years.

Chuck Gibbons has prospected in the Yukon for many years, frequently teaming up with Pete and Harry Verslucce.



Great Plains Development Co. of Canada Ltd. prospected and mapped portions of its permit in the James River area (24) and identified areas of acidic volcanics which will require additional work next year. The company also examined its claims in the vicinity of the *Yava Syndicate's* discovery (1) and optioned a lead prospect at Bathurst Inlet (28).

In the fall of 1974, the Geological Survey of Canada released data on a copper-zinc discovery made by Dr. J. B. Henderson during the summer at Point Lake (25). This was staked by *Precambrian Mining Services Ltd.* and *Rayrock Mines Ltd.* Several claim groups were staked in the general area by *Noranda Exploration Ltd.* and other companies.

Mackenzie Mountains.

Jomial Investments Ltd., mapped the OS, BOB and DA claim groups and examined copper mineralization on the NOON and DAY groups (32).

Redstone Resources Ltd. optioned its copper project at Coates Lake (37), 200 miles to the southeast of Godlin Lakes to *Shell Canada Ltd.*

Copper-Nickel

Keewatin District

Geophysical Engineering Ltd. mapped the TGOOD and LAMOON claims in the Munro Lake area (13) and are planning to conduct ground geophysical surveys on these claims before spring. Boulders containing high values of nickel and copper had been reported on these claims but the only mineralized boulders found contained only minor disseminated pyrite and chalcopyrite.

Cominco Ltd. had a five-man prospecting crew in the Hayes River area (14) studying the geology and mineral potential of a series of ultrabasic bodies mapped by the Geological Survey of Canada in 1973.

Perry River Area

Cominco Ltd. investigated nickel-copper float at the mouth of the Perry River (30) on claims optioned from *Perry River Nickel Mines Ltd.* Geological mapping, gravity, magnetometer and EM surveys have identified a drill target to be tested next year.

Uranium

Uranium exploration increased threefold between 1973 and 1974 in the Northwest Territories. Several large companies entered the Territories for the first time and once again prospectors from Uranium City, Fort Smith, Hay River and Yellowknife included geiger counters with their standard gear.

Keewatin and Arctic Islands

Imperial Oil Ltd. conducted airborne scintillometer surveys over southern Baffin Island and, as a result, have staked several hundred claims in the Frobisher Bay area (41).

Pan Ocean Oil Ltd. acquired eight new prospecting permits to add to its existing claim groups south of Baker Lake (42). *Kenting Surveys Ltd.* flew a spectrometer survey over the new permits early in the summer and a ten-man crew spent the remainder of the summer prospecting and performing geophysical surveys on the anomalies outlined. Only one-third of the planned work was performed owing to inclement weather.

Shell Canada Ltd. acquired six permits centred on Tebesjuak Lake (43). They were then surveyed for radioactivity by *Kenting Surveys Ltd.* and the resulting anomalies checked by ground survey crews. Most of the anomalies correspond to boulder ridges and outcrops of the uniformly fluorite-bearing, slightly radioactive granite which forms the basement in most of the permit area. Brief reconnaissance surveys were performed in areas from Artillery Lake to Chantrey Inlet.

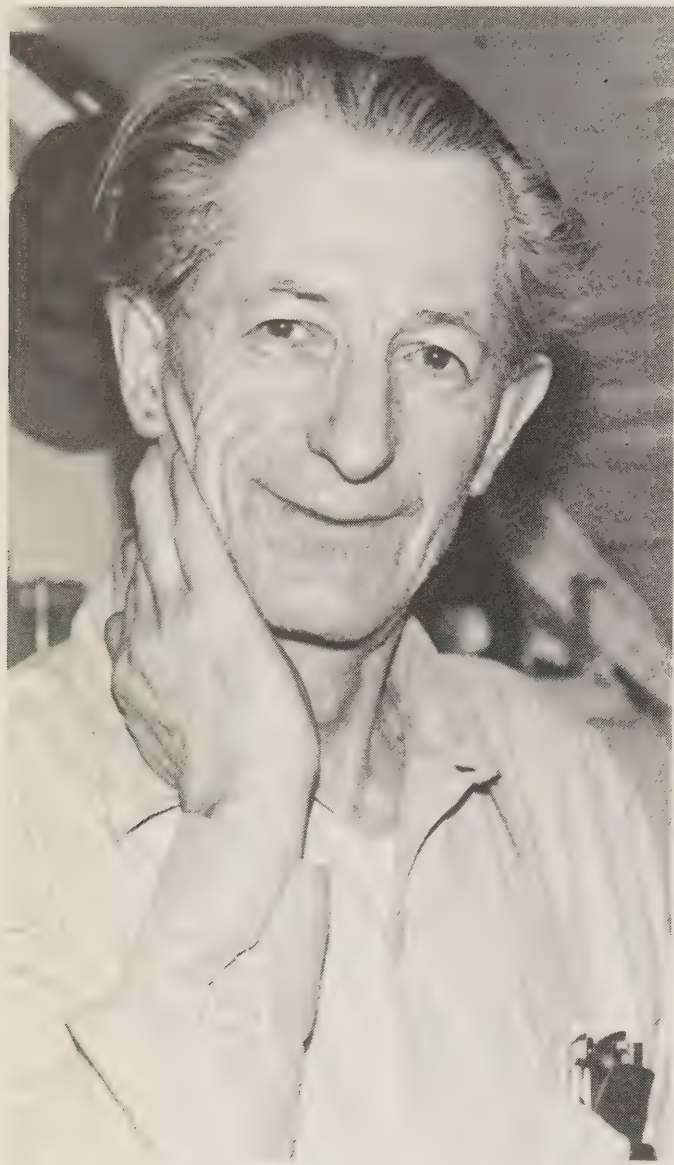
Metallgesellschaft Canada Ltd. acquired 11 prospecting permits in the Schultz Lake area (44). A twelve-man crew including five Inuit from Baker Lake were engaged all summer in flying a low level spectrometer survey over the Dubawnt Group — basement complex contact and checking the anomalies found during previous surveys flown in 1969. The crew also collected water samples which were analyzed for radon.

Mackenzie District

Noranda Exploration Ltd. spent a part of the summer flying a spectrometer survey and prospecting in the Beaverhill Lake area (45), probably along the contact between the Dubawnt sandstone and the basement complex. The company staked and prospected several

Tony Worbitts, an old-time prospector, continues to look for hard rock and placer properties.

Wally Green discovered Wellgreen nickel-copper mine on Quill Creek at Mile 1111 of the Alaska Highway in the early 1950's. This mine closed down in 1973.



of the uranium highs detected by the Geological Survey of Canada's survey between Lake of the Enemy (46) and the edge of the Shield north of Yellowknife.

Trigg, Woollett and Associates spent a few weeks mapping and prospecting in the Nicholson Lake area (47).

Mattagami Lake Mines Ltd. staked two claim groups in the Beauvais Lake area (48) as a result of an airborne scintillometer survey which was extended northward into the Northwest Territories from Saskatchewan.

Enex Resources Ltd. conducted geological mapping and prospecting as well as ground spectrometer surveys in the Target Lake area (49) over the KIANLA claim group.

Uranerz Canada Ltd. conducted airborne and ground radioactivity surveys over the TSU claim group in the vicinity of Tsu Lake (50). The company also spent the summer in the Bathurst Inlet area (28) examining the rocks of the Goulburn Group.

Shell Canada Ltd. optioned the BM claim group on MacInnes Lake (51) from *Consolidated Shunsky Mines Ltd.* The uranium showing on the claims was resampled and the property subjected to geological and radioactivity surveys.

A new uranium showing was staked by *D. Smith*, a Yellowknife prospector, four miles north of Mazenod Lake (52) as a result of a Geological Survey of Canada release. Pitchblende and hematite are present in narrow veinlets in granitic rocks parallel to a major quartz vein. Grab samples from the showing gave assays up to 12 per cent uranium oxide.

Imperial Oil Ltd. conducted reconnaissance prospecting in the Nonacho Lake area (51) and along the Wopmay Fault (53). The company also acquired a prospecting permit in the Mountain Lake area (54) adjacent to a known uranium showing in the sediments of the Hornby Bay Group. *Trigg, Woollett and Associates*, on behalf of *Imperial Oil Ltd.*, mapped the permit and drilled several holes for stratigraphic information.

BP Minerals Ltd. acquired three permits over the Hornby Bay Group rocks (54) and conducted a spectrometer survey and a lake sediment sampling survey over the permits. The company also prospected in the vicinity of the Wopmay Fault (53).

Cominco Ltd. conducted a prospecting program over Hornby Bay Group rocks (54) and staked several claim groups in the vicinity of St. Germain Lake (55).

Rio Tinto Canadian Exploration Ltd. mapped its RT claim group at Greenrock Lake (53).

Gold-Silver

There was a significant increase in the number of gold properties drilled and sampled this year. Companies now seem to be convinced that the price of gold will remain over \$150 per ounce and are therefore prepared to invest in developing gold properties.

O'Brien Gold Mines Ltd. delayed underground exploration on its Kognak River property (56) because of market conditions, but the company was able to extend the airstrip to accommodate Hercules aircraft and to refurbish its camp.

Tundra Gold Mines Ltd. conducted a magnetometer and EM survey and a soil geochemical survey on portions of its property at Matthews Lake (57) to define the contact between volcanic and sedimentary rock and to identify mineralized conductors.

Perry River Nickel Mines Ltd. optioned the TK group in the Matthews Lake area (57) and identified two six-foot wide zones which require additional work.

Canadian Superior Exploration Ltd. and several other companies conducted preliminary geological and geophysical studies over claim groups adjacent to the *Canadian Nickel Co. Ltd.* gold deposit at Contwoyto Lake (58).

Arcadia Explorations Ltd. drilled between 7,000 and 8,000 feet on the Sidewalk and North veins on its Coronation Gulf gold properties (59). Results were encouraging.

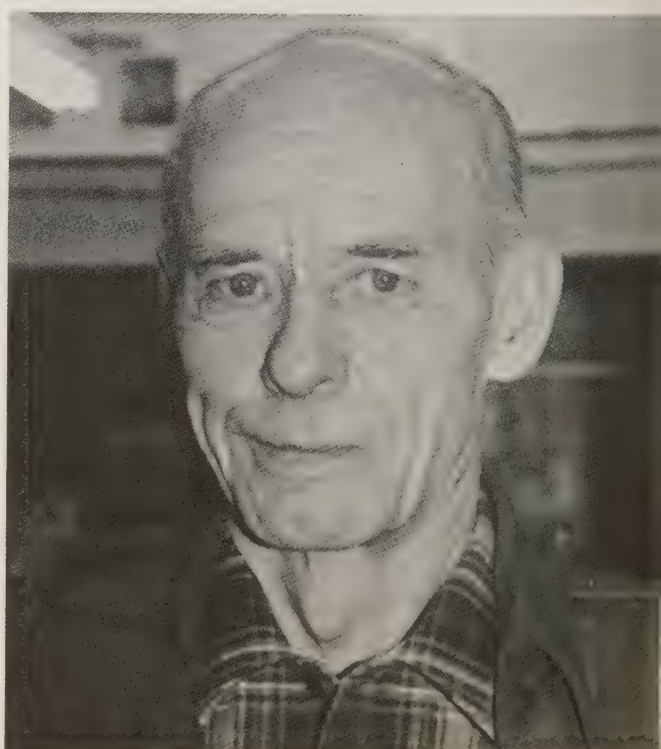
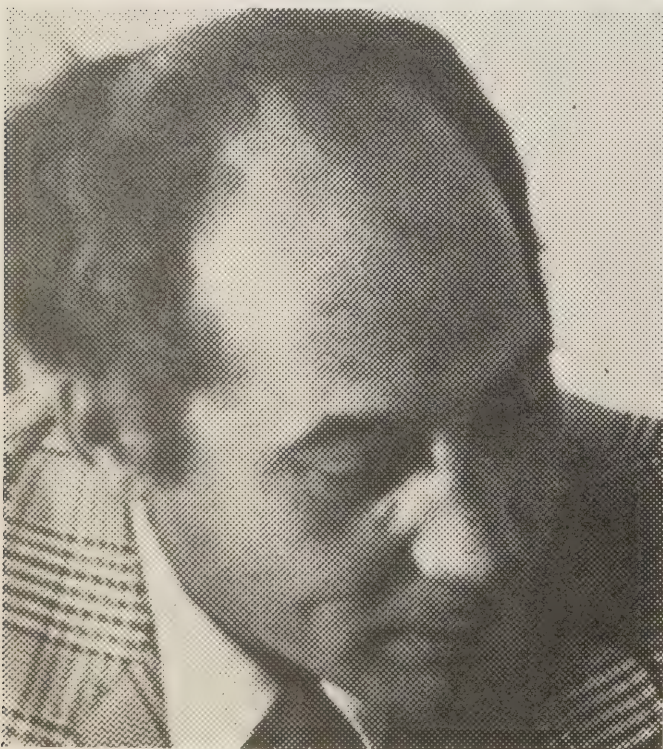
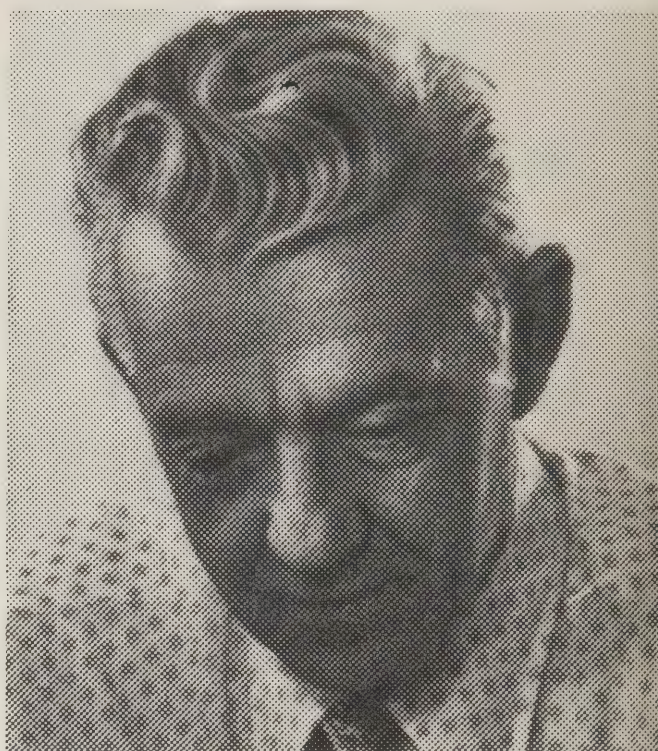
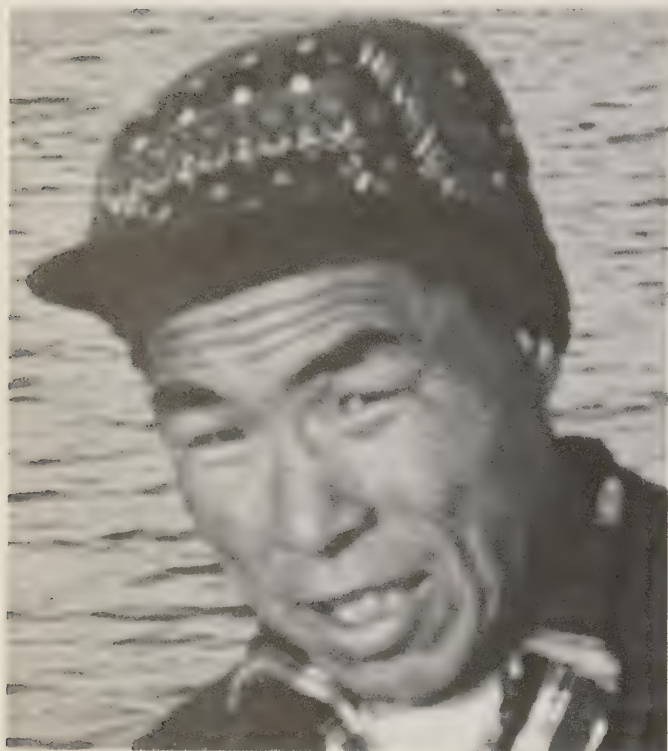
Terra Mining and Exploration Ltd. positioned a scooptram and compressor on the TA claims at Bullmoose Lake (60) in preparation for an underground development program to start in 1975. The claims are optioned from *Duke Mining Ltd.*

Noel Avadluk, an Inuit prospector from the Northwest Territories, prospected on the Arctic Coast and found high-grade silver mineralization in the Hope Bay area.

Pete Risby, one of the more successful modern-day prospectors, found many prospects now being developed in the Yukon. He also found time to train other prospectors in the Ross River area.

Al Kulan made the big lead-zinc find in the Yukon's Vangorda Creek area in the early 1950's and in association with Dr. Aaro Aho, John Brock and Gordon Davis, found the mineralization in 1963 which led to the opening of the Anvil mine.

Andy Anderson is a long-time Yukon prospector who is still looking for the big mineral find.



Duke Mining Ltd., in turn, has purchased the TT claims on Dome Lake (61). During the summer, mining equipment was brought to the property and shallow drilling tested the Lambert and No. 14 veins on the property. The best reported intersection is 1.54 ounces of gold per ton over 4.5 feet.

Precambrian Shield Resources Ltd. conducted an extensive underground bulk sampling operation and a diamond drilling program on the WT claim group at Myrt Lake (61). Final results indicate 600 tons per vertical foot grading 0.16 ounces of gold per ton.

Orion Mines Ltd. sampled the ALICE claim group on Sunset Lake (61).

Lynx Yellowknife Gold Mines Ltd. conducted a small mining operation on its good grade gold property north of the Giant Yellowknife Mine (62). Some 150 tons had been stockpiled by winter.

Giant Yellowknife Mines Ltd. continued to explore its Northbelt claims which stretch for several miles due north of its present mine (62). Geological mapping and diamond drilling were completed during the year.

Anglo United Development Corp. Ltd. drilled its gold showings on the CJ and IO claim groups on the Snare River (63). The purpose of the program was to increase the known tonnage of ore on the property.

Discovery Mines Ltd. conducted an underground exploration program at Camlaren Mines on Gordon Lake (61). The shaft was deepened to 840 feet and a drift was put out from the 800-foot level. Diamond drilling is now being carried out to probe beneath this level.

At Baton Lake (71) *Cominco Ltd.* drilled 9,400 feet in 20 holes to test a 200-foot wide quartz albite dike several thousand feet long which was reported to contain 0.085 ounces of gold per ton. The claims were optioned to *Cominco Ltd.* by *Johnsby Mines Ltd.*

Giant Yellowknife Mines Ltd. drilled the MOS claims at the south end of Mosher Lake (63). *Seaforth Mines Ltd.* and *Geo-Dyne Resources Ltd.* drilled another gold showing on the MAG claims in the middle of Mosher Lake. Both programs intersected sub-economic mineralization.

Giant Yellowknife Mines Ltd. conducted a magnetometer survey over its TREE claims near Point Lake (25). Gold mineralization is associated with sulphides in an amphibolite horizon.

Nemco Exploration Ltd. evaluated several gold properties north of Yellowknife by mapping and sampling. These included the LOG claims at Gordon Lake (61) and the FARR and NEMCO claims at Hope Bay (64).

Northrim Mines Ltd., at the end of the year, was preparing to commence an underground decline on *Federated Mining Co. Ltd.* silver property in the Camsell River (16).

A placer operation was begun by prospector *B. Taylor* near McMillan Lake (65) in the Mackenzie Mountains.

Other Minerals

Diapros Canada Ltd. and *Cominco Ltd.* bulk sampled kimberlite pipes on Somerset Island (66) to determine the possible diamond content of the pipes.

Inland Cement Ltd. optioned the MARY claims near Snowdrift (67) and drilled and sampled a barite vein. The barite is of high quality and is present in sufficient quantity for the company to consider production for the market in the Mackenzie Delta.

Amax Northwest Mining Co. Ltd. continued its feasibility study on the MacMillan Pass (68) tungsten deposit and mapped the geology of the CAC claim group, 20 miles east of *Canex Placer's* camp near Summit Lake, where a quartz monzonite stock intrudes limestone and shale of the Road River Formation.

Canada Tungsten Mining Corp. Ltd. completed a Turam survey over a large claim group east of its mine (69).

Welcome North Mines Ltd. staked iron deposits in the Mount Davies Gilbert area (70), 80 miles west of Inuvik. Preliminary sampling indicates the possibility of several billion tons of siderite grading 20 to 30 per cent iron and up to five per cent phosphorous pentoxide.

Yukon Territory

Mining Production

The value of mining production in the Yukon increased from \$150,667,311 in 1973 to \$185,041,000 in 1974, an increase of \$34,373,689 — or 23 per cent. Production came from five mines — three underground and two open-pit mines — which together produce lead, zinc, copper, silver, asbestos, cadmium, gold and coal. Lead-zinc accounted for 61 per cent of total value of production. The Yukon was the leading lead producer in Canada for the third consecutive year.

Lead-Zinc-Silver

Anvil Mining Corporation Ltd. operated a large lead-zinc open-pit mine in the Ross River area, some 130 air miles northeast of Whitehorse. It is the largest producer in the Yukon.

Anvil Mining Corporation Ltd.

Type:	Open-pit
Location:	130 miles northeast of Whitehorse
Product:	lead, zinc, silver, gold
Rate:	8,146 tons per day
Total Tons Milled:	2,925,359
Reserve Grade:	3.1 per cent lead, 5.5 per cent zinc, 1.1 ounces per ton silver
Reserves:	52,599,325 tons
Employees:	422

Asbestos

Cassiar Asbestos Corporation Ltd. operated an open-pit asbestos mine at Clinton Creek, 50 miles northwest of Dawson City. It produced at a rate of 5,314 tons per day — an increase of 476 tons per day over 1973.

Cassiar Asbestos Corporation Ltd.

Type:	Open-pit
Location:	50 miles northwest of Dawson City
Product:	asbestos fibre
Rate:	5,314 tons per day
Total Tons Milled:	1,457,237
Reserve Grade:	5.64 per cent fibre
Reserves:	Probable — 7,861,123 tons Possible — 8,792,000 tons
Employees:	308

Silver-Lead-Zinc-Cadmium

United Keno Hill Mines Ltd. increased its milling rate from 256 tons a day in 1973 to 297 tons a day in 1974. Value of production increased mainly because of the increase in price of silver and zinc.

United Keno Hill Mines Ltd.

Type:	Underground
Location:	31 miles northeast of Mayo
Product:	silver, lead, zinc, cadmium
Rate:	297 tons per day
Total Tons Milled:	93,232
Reserve Grade:	47.7 ounces per ton silver, 5.8 per cent lead, 1.5 per cent zinc
Reserves:	84,500 tons
Employees:	302

Copper

Whitehorse Copper Mines Ltd. began production from underground in December, 1972. Reserves as of December 31, 1973 for underground ore were reported to be 3,182,388 tons of 2.03 per cent copper.

Whitehorse Copper Mines Ltd.

Type:	Underground
Location:	Seven miles south of Whitehorse
Product:	copper, silver, gold
Rate:	1,919 tons per day
Total Tons Milled:	626,541
Reserve Grade:	See Reserves
Reserves:	3,182,388 tons averaging 2.03 per cent copper, 2,637,680 tons averaging 0.91 per cent copper
Employees:	204

Coal

Tantalus Butte Coal Co., operated by Anvil Mining Corporation Ltd., continued mining coal through the year. Production stood at 70 tons a day. The coal is shipped to the Anvil Mine and used for drying lead-zinc concentrates.

Tantalus Butte Coal Co.

Type:	Underground
Location:	Carmacks
Product:	coal
Rate:	70 tons per day
Total Tons Milled:	17,027
Reserve Grade:	thermal coal
Employees:	20

Developing Properties

Asarco and Silver Standard Mines Limited began feasibility studies on their 5.2 million ton orebody near Minto. Fill-in drilling was completed during the year. The grade of the orebody is 1.8 per cent copper with minor values in precious metals.

Mineral Exploration

In 1974, \$12 million was spent on mineral exploration in the Yukon. This reflects an increase in activity over the previous year, as well as higher exploration costs in remote areas of the territory.

Main areas of interest during the year were the Minto and the Anvil Range areas (Whitehorse Mining District), the Bonnet Plume River area (Mayo Mining District), and the Summit Lake-Howard's Pass area (Watson Lake Mining District). There was also moderate activity in the southern Richardson Mountains, as well as in the Ogilvie Mountains west of the Dempster Highway (Dawson Mining District).

Copper

Whitehorse Mining District

Whitehorse Copper Mines Limited continued exploratory work on its Whitehorse Copper Belt (72) properties (105 D 10, 11, 14). Detailed geological mapping was carried out on the VERONA 115 claim. Magnetometer and IP surveys were run over the JIM claims, and 20 diamond drill holes totalling 4,956 feet were completed on the WE and JIM claims. The company also did some geological mapping, soil sampling, and trenching on the GROUSE group of claims (105 D 11, 60° 41'N, 135° 22'W), on which it has an option from E. Kreft and S. Takacs. This latter work is to be followed up in 1975 by magnetometer surveys and additional geological mapping. Orebodies in the Whitehorse Copper Belt consist essentially of bornite and chalcopryite in skarn zones developed in limestones adjacent to diorite-granodiorite intrusions of the Coast Range suite.

In the Minto area (73), where a significant copper discovery was made in 1973, a number of companies were active in 1974. In addition to detailed drilling of the orebody, a number of exploration programs including diamond drilling were carried out on adjacent properties.

United Keno Exploration, a consortium representing *Canadian Superior Exploration Limited*, *Falconbridge Nickel Mines Limited* and *United Keno Hill Mines Limited*, carried out 27,029 feet of diamond drilling on the DEF claim group (115 I 11, 62°38'N, 137°15'W). To the south, jointly owned by *Asarco Exploration Company of Canada Limited* and *Silver Standard Mines Limited*, Asarco carried out 36,838

feet of diamond drilling. Much of this drilling was centred on the mineral deposit which straddles the boundary between the two properties. The mineral deposit is roughly flat-lying and approximately 1,200 feet long and 800 feet wide. The deposit occurs as veinlets and disseminated grains and irregular blebs of bornite and chalcopryite in gneissic, biotite-rich zones within granodiorite. The principal mineral deposit is estimated to contain in excess of eight million tons of 1.8 per cent copper with minor gold and silver. Feasibility studies on the mineral deposit are currently underway.

United Keno Exploration also drilled a 700-foot hole on the SUN claims (115 I 11, 62°38'N, 137°12'W) east of the DEF group (73).

Dawson Range Joint Venture completed 3,250 feet of diamond drilling on the BEN, PAL, KAP and NEB claims (115 I 11, 62°36'N, 137°15'W) which adjoin the eastern boundary of the MINTO claims (73).

Pinnacle Mines Limited and *Yukon Gold Placers Limited* own the COMANCHE claims (115 I 11, 62°36'N, 137°19'W) adjacent to the western boundary of the MINTO group. Work in 1974 consisted of 2,793 feet of diamond drilling in five holes.

On the NAVAJO claim group (115 I 11, 62°39'N, 137°18'W), *Black Giant Mines Limited* drilled five holes totalling 2,685 feet. The property adjoins the southwest and northwest sides of the DEF claim group (73).

Bow River Resources Limited and *Northair Mines Limited* drilled a single 700-foot hole on the ROD and AL claim groups (115 I 11, 62°39'N, 137°08'W) in the Minto area.

Taseko Mines Limited carried out 988 feet of drilling in three holes on the COIN group (115 I 11, 62°38'N, 137°07'W) five miles east of the Minto copper discovery (73). On the COIN property, copper occurs as disseminated bornite and chalcopryite in altered volcanics at the contact with granodiorite.

Southeast of the Minto area *United Keno Exploration* conducted geological mapping and soil sampling on the DEL claims (115 I 7, 62°27'N, 136°45'W) north of Hoochekoo Creek. Minor malachite, azurite, pyrite and chalcopryite were reported associated with basic dikes intruding diorite.



MINERAL EXPLORATION AND MINING - YUKON & N.W.T.

SCALE OF MILES
0 100 200 300 400

LEGEND



PRODUCING MINE

RAILWAY

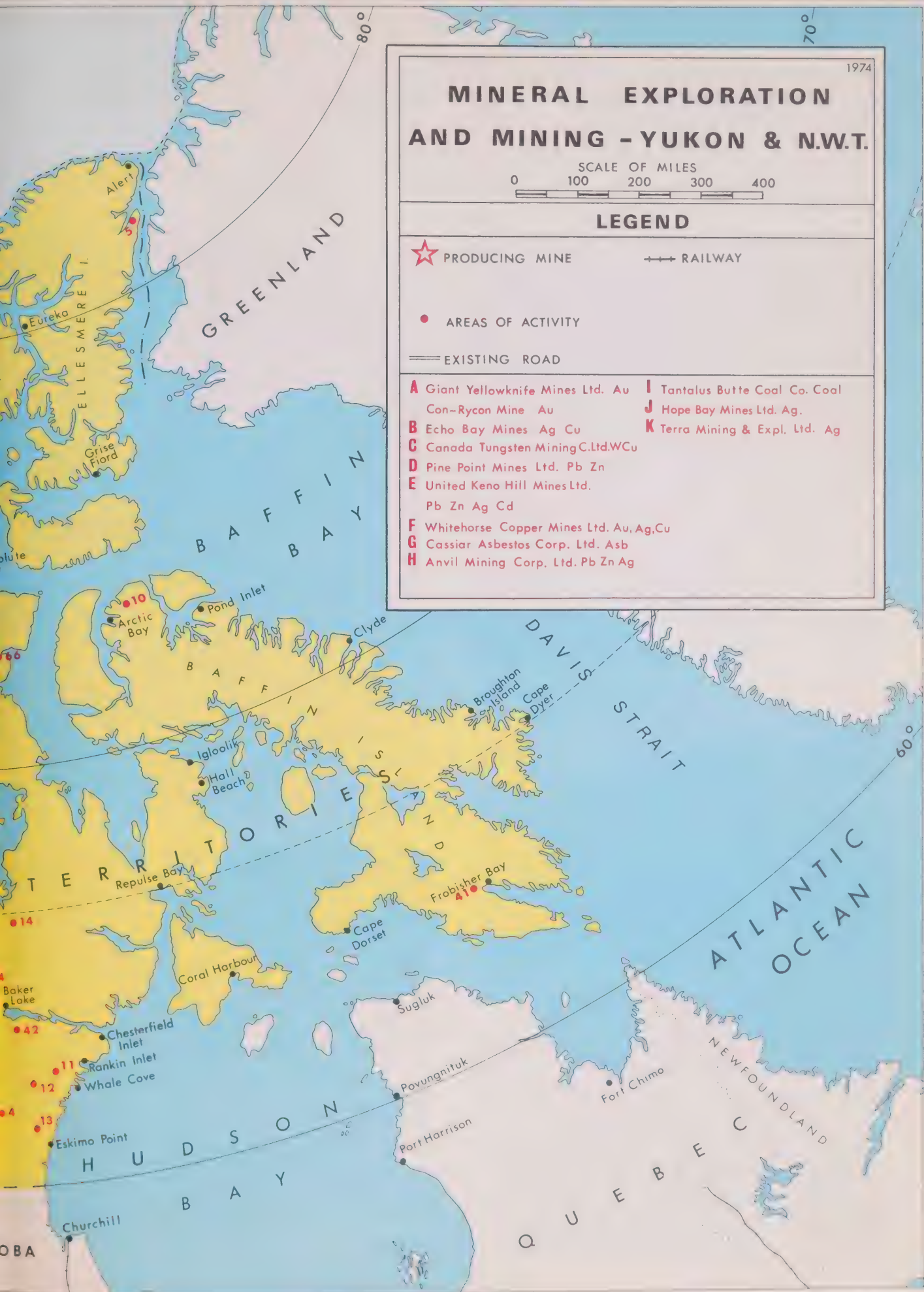


AREAS OF ACTIVITY



EXISTING ROAD

- | | |
|---|---------------------------------------|
| A Giant Yellowknife Mines Ltd. Au | I Tantalus Butte Coal Co. Coal |
| B Echo Bay Mines Ag Cu | J Hope Bay Mines Ltd. Ag. |
| C Canada Tungsten Mining C. Ltd. WCu | K Terra Mining & Expl. Ltd. Ag |
| D Pine Point Mines Ltd. Pb Zn | |
| E United Keno Hill Mines Ltd.
Pb Zn Ag Cd | |
| F Whitehorse Copper Mines Ltd. Au, Ag, Cu | |
| G Cassiar Asbestos Corp. Ltd. Asb | |
| H Anvil Mining Corp. Ltd. Pb Zn Ag | |

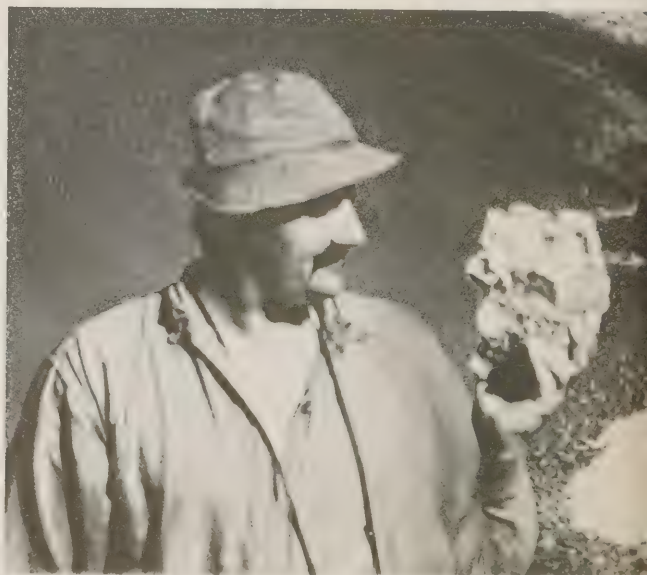


Armand Arsenault, who owned a successful diamond drilling company in the Yukon, became interested in prospecting and mine development in the late 1960's.

Ted Skonseng, who died in 1973, took part in the Anvil Mine discovery and found the high grade silver-lead veins of the Plato property near Roque River in an inaccessible part of the Yukon, 110 miles north of Faro.

Art Anderson discovered the asbestos prospect which developed into Clinton Creek asbestos mine.

Mike (Montreal Mike) Chefkoi found silver-lead mineralization in the 60 Mile River area in the mid-1960's. He operated out of Dawson City.



In addition to the detailed property examinations, a number of companies including *Klotassin Joint Venture, D.C. Syndicate, Amoco Canada Petroleum Company Limited* and *Canex Placer Limited* carried out regional exploration programs in the general Dawson Range area.

Silver City Mines Limited continued its program of underground exploration on the 2,800-foot level at its copper property in the Upper White River area (115 G 13, 61°46'N, 140°47'W). Native copper and thin stringers of chalcocite were reported in sheared, amygdaloidal volcanics (74).

Union Minière Explorations and Mining Corporation conducted a program of geological mapping, soil and stream sediment, and rock geochemistry over the SHAD claims (75), 28 miles south of Carmacks (115 H 9, 61°40'N, 136°20'W). Disseminated bornite and pyrite were found in Mesozoic volcanics near the contact with a granodiorite intrusive.

Asarco Exploration Company of Canada Limited conducted geological mapping and reconnaissance geochemical surveys on the BOB and STELLA claims east of Merrice Creek in the Carmacks area.

In the Hayes Creek area, *D.C. Syndicate* mapped and soil sampled the NADA claims. *D.C. Syndicate* also soil sampled the WON claims north of Granite Mountain.

Lead-Zinc-Silver

Whitehorse Mining District

Cyprus Anvil Mining Corporation carried out exploratory work on the main FARO claim block (105 K 6). Turam, gravity and magnetometer surveys were conducted on the RICH, GALE and ROCK claims, while 3,000 feet were drilled in three holes on the SUN and FARO claims (76). A subsidiary company, *Ridgemont Mining Corporation*, did soil geochemistry and Turam and magnetometer surveys over the LISA claims. Geological mapping, geochemistry and geophysical surveys were carried out on the DANA property and also three holes totalling 1,634 feet were drilled.

Kerr Addison Mines Limited and *AEX Minerals Corporation* (76) carried out an extensive drilling program on their zinc-lead-silver discovery in the Vangorda Creek area (105 K 6, 62°16'N, 133°13'W).

The discovery zone appears to be an extension of the previously known Champ and Firth zones and is thought to be stratigraphically equivalent to, and possibly continuous with, *Kerr Addison's* Vangorda deposit to the southeast. This year's program included four drills operating from mid-July until mid-December and included over 60,000 feet of drilling. At least four zones carrying ore grade have been intersected at depths ranging from 200 to 1,500 feet. No official estimates regarding tonnage and grade have been released yet. The ore occurs as massive lenses of galena and sphalerite associated with pyrrhotite and pyrite in phyllite and graphitic schist.

Teck Mining Group Limited and *Silver Standard Mines Limited* carried out geological mapping, soil geochemistry and geophysical surveys over the RIDGE claims (105 K 3, 62°10'N, 133°23'W). The property is located south of the Campbell Highway at the Faro turnoff. Similar work was done on the ELLE claims (105 K 6, 7, 62°17'N, 133°01'W), which are located on the northwest side of Blind Creek (76).

Jackpot Copper Mines Limited drilled two shallow holes on the Tatshenshini silver property (115 A 3, 60°07'N, 137°08'W), three miles west of Dalton Post. The showing consists of a vein of galena cutting through porphyritic acid volcanic rocks near the contact with granodiorite (77).

Watson Lake Mining District

In the Summit Lake area of the Selwyn Mountains (31), mineral exploration activity in 1974 was lower than 1973. *Canex Placer Limited* continued exploration on the Howard's Pass property (105 I 12, 62°33'N, 129°30'W) with detailed geological mapping of the X and ANNIV claims and bulldozer trenching on the X claims. The company also drilled 10 holes totalling 4,076 feet on the X claims.

The bedrock geology consists of Lower Paleozoic sediments folded along northwest-trending axes. Fine-grained, stratiform galena and sphalerite occur in a black, graptolitic shale of Lower Ordovician age approximately 200 feet above the contact of the shale and Upper Cambrian limestone.

Dynasty Explorations Limited conducted soil geochemistry on the PAS, GULL, TAP, DEA and TAM claims (105 I 5, 6, 11, 12, 62°30'N, 129°30'W) in the Summit Lake-Howard's Pass area (31). The company also conducted detailed geological mapping on the PAS and TAP claims and extensive trenching of lead-zinc mineralization on the PAS claims. In addition, 1,661 feet were drilled in four diamond drill holes on the PAS claims. Dynasty also carried out geological mapping, soil geochemistry and magnetometer surveys on the MS claims in the Itsi Lake area (105 J 16, 62°46'N, 130°11'W) (78).

Thor Explorations Limited carried out soil sampling on the POS claim group, northwest of Summit Lake (105 I, 62°30'N, 129°45'W) (31).

NRD Mining Limited did limited trenching on the MTX claims (105 I, 62°35'N, 129°43'W) (31).

In the Saint Cyr Range of the Pelly Mountains, *Tintina Silver Mines Limited* carried out a program of soil and rock geochemistry, trenching and diamond drilling on the EAGLE claims, approximately 80 miles southeast of Ross River (105 G 3, 61°08'N, 131°10'W). Total footage drilled was 11,899 feet in 97 holes (79).

Bedrock geology in the area consists of Lower Paleozoic sediments folded along northwest-trending axes and intruded to the northwest by a Mesozoic granodiorite plug. Massive to disseminated galena and sphalerite with significant silver content occur in the crests of small anticlinal folds in limestone overlain by graphitic shale.

Cyprus Anvil Mining Corporation did geological mapping, soil sampling and magnetometer surveys on the MM and JJ claims (105 F 10, 61°36'N, 132°45'W) about 25 miles northeast of Quiet Lake (80). Two holes were drilled with total footage of about 2,000 feet. Lead-zinc mineralization occurs in a sequence of pyritic mica schists and phyllites.

Hudson Bay Exploration and Development Company Limited did geological mapping, soil geochemistry, hand trenching and about 1,500 feet of diamond drilling on the ANGIE claims (81) in the Irvine Lake area (105 B 11, 60°38'N, 131°11'W). Disseminated galena and sphalerite occur in a diopside and magnetite skarn, associated with muscovite and chlorite quartz schists and gneisses.

Granby Mining Company Limited did soil geochemistry, hand trenching and 1,799 feet of drilling in eight holes on the MEL (82) and JEAN claims, 50 miles east-northeast of Watson Lake (95 D 6, 60°20'N, 127°25'W). Sphalerite and galena occur in a limestone bed at the contact with a limy siltstone.

Mayo Mining District

Exploration activity in the Mayo Mining District was concentrated in the Bonnet Plume River area (83), 120 miles northeast of Mayo, where a significant zinc occurrence was discovered at Goz Creek by *Barrier Reef Resources Limited* in June, 1973. Additional discoveries were also made in the Harrison Creek and Corn Creek areas. These discoveries generated a staking rush during the summer of 1973, which continued through the winter and into the spring of 1974. Heaviest staking has been around Goz Creek and in a northwesterly direction toward Corn Creek and Pinguicula Lake.

Most of the zinc deposits discovered to date occur in a thick-bedded, porous dolomite of Lower Cambrian age. The principal occurrences consist of light-coloured, high-grade sphalerite deposits in silicified breccia zones.

Barrier Reef Resources Limited carried out geological mapping of the Goz Creek property (106 C 7, 64°26'N, 132°31'W) as well as a diamond drilling program involving 6,639 feet in 20 holes. Most of the drilling was centred on the high-grade zone in a silicified breccia and approximately one million tons of ore grading 13 per cent zinc was outlined.

Sicintine Mines Limited carried out geological mapping and soil and rock geochemistry on the BID and NAD claims (106 C 8, 64°27'N, 132°30'W). These claims are partly on Goz Creek, adjacent to the Barrier Reef property (83).

Chatex Mines Limited conducted geological mapping and soil and rock geochemistry on the ACE claims (106 C 7, 64°28'N, 132°34'W) northwest of Goz Creek.

Tournigan Mining Explorations Limited soil sampled the LEE, TEE and ZIN claims (106 C 7, 64°21'N, 132°42'W) on the south side of Goz Creek.

Great Plains Development Company Limited (83) carried out soil sampling and geological mapping on its BOB and RAY claims (106 C 7, 64°22'N, 132°35'W) in the Harrison Creek area.

Archer, Cathro and Associates Limited (84) staked the FLUNK (106 E 2, 65°06'N, 134°47'W) and MST (106 E 3, 65°06'N, 135°03'W) claims 18 miles southwest of Margaret Lake and carried out geochemical sampling and geological mapping. Concentrations of pale sphalerite occur in breccias cross-cutting Lower Cambrian dolomite.

Action Resources Limited (83) did geological mapping and soil and rock geochemistry on the RYE and BID claims on upper Goz Creek (106 C 8, 64°28'N, 132°27'W).

Getty Mining Pacific Limited (83) conducted geological mapping and stream sediment geochemistry on the Coulter Option property (106 C 7, 64°25'N, 132°40'W) of *Action Resources Limited*. These claims are on Goz Creek, west of Barrier Reef's property.

Serem Limited (83) did geological mapping and soil geochemistry on the GUS claims (106 C 8, 64°26'N, 132°20'W) on Duo Creek, six miles upstream from its confluence with Goz Creek.

Cypress Resources Limited (83) staked additional claims on its Bonnet Plume property (106 C 7, 64°27'N, 132°55'W) which is about 12 miles west of the Barrier Reef discovery. Together, *Cypress* and *British Newfoundland Exploration Limited* carried out a program of geological mapping, soil sampling, IP surveys, trenching and 3,000 feet of diamond drilling in seven holes. About 12 separate sphalerite deposits occur within 3.5 miles along a continuous, permeable horizon in the upper part of the Sekwi Formation.

Cominco Limited and *Coast Copper Limited*, a subsidiary company, conducted considerable exploration in the Bonnet Plume area (83). Geological mapping and soil geochemistry were done on the HA, FUN, CAT, BEAR, MOUSE and JMA claims (106 C 6, 7) in the vicinity of Goz and Duo Creeks. Some trenching was also done on the BEAR claims. About 25 miles farther to the northwest, in the Corn Creek area, geological mapping and soil geochemistry

programs were carried out on the WX, DF, DEA, STAR and SUN claims (106 C 10, 11, 14, 15, 64°45'N, 133°00'W). Some hand trenching was done on the DEA claims and one hole was drilled to 315 feet on the STAR claims.

Bow River Resources and *Highhawk Mines Limited* did geological mapping and soil geochemistry on the PING, PONG and BAT claims (106 C 11, 64°38'N, 133°15'W) in the Corn Creek area (85).

Amax Exploration, Incorporated (85) did preliminary prospecting and geological mapping on the DAN and DOC claims in the Corn Creek area. Prospecting and geological mapping were also carried out on the DTG claims (106 C 13, 64°49'N, 133°36'W) on Dolores Creek.

Dynasty Explorations Limited (85) did geological mapping and soil geochemistry on the EG claims (106 C 14, 64°51'N, 133°08'W). The company also conducted geological mapping, soil geochemistry and trenching on the PLATA and INCA claims (105 N 9, 105 O 12, 63°35'N, 132°00'W) in the Hess Mountains (86). Galena and tetrahedrite occur in fault zones within a Paleozoic sequence of black chert, shale and quartzite.

Noranda Exploration Company Limited (83) conducted geological mapping on the ECON claims (106 B 6, 64°20'N, 131°13'W) 22 miles east of Bonnet Plume Lake.

Welcome North Mines Limited (70) carried out geological mapping, soil geochemistry and 1,000 feet of diamond drilling on the CAB claims (106 C 16, 65°00'N, 132°30'W). The property is located on the Yukon-N.W.T. border, about 40 miles north of Barrier Reef's discovery on Goz Creek.

In the Clark Lakes area 45 miles northeast of Mayo, *Bullion Mountain Mining Limited* (85) carried out 1,171 feet of drilling in seven drill holes on the PAUL claims (106 D 2, 64°06'N, 134°59'W). Silver-lead-zinc mineralization occurs here in a fracture zone in Cambrian limestone.

Canadian Reserve Oil and Gas Limited and *Silver Spring Mines Limited* conducted geological mapping and soil geochemistry on the Rambler Hill property (106 D 3, 64°05'N, 135°15'W) three miles east of the south end of McQuesten Lake (85).

Dawson Mining District

Amax Exploration, Incorporated (84) conducted preliminary geological mapping, prospecting and sampling on the TUKU, ALI, RAS and TUS claims (106 E 14, 106 L 4) in the Doll Creek area of the southern Richardson Mountains. Geology in the area consists of Lower Cambrian micritic limestones overlain by fine grained clastics. Galena, sphalerite and hydrozincite occur in fault zones and in fractures and vugs in the limestone.

Noranda Exploration Company Limited carried out geological mapping, stream sediment geochemistry and soil geochemistry on the ENOC, ONCE, TWICE and CENO claims (106 E 14, 106 L 4) in the southern Richardson Mountains (84). Geology is similar to that on the Amax properties. *Noranda* also did geological mapping and stream sediment geochemistry on the CUNG claims (87) east of the Hart River (116 H 7, 65°22'N, 136°47'W).

Brascan Resources Limited did geological mapping, minor soil geochemistry and hand trenching on the GIRLY *et al* claims (116 J 5, 66°20'N, 139°40'W) in the northern Ogilvie Mountains (88). Sporadic occurrences of sphalerite were found in bedded dolomite.

Klondike Explorations Limited carried out some soil geochemistry, hand trenching and 120 feet of diamond drilling on the KEM claims (116 B 7, 64°22'N, 138°42'W). The property is located in the southern Ogilvie Mountains about 30 miles northeast of Dawson (89). Veins of silver-bearing galena with minor sphalerite occur in Keno Hill quartzite and associated greenstone.

Dynasty Explorations Limited conducted geological mapping and soil geochemistry on the OZ claims (116 B 12, 64°45'N, 139°45'W) (89) and the BILBO claims (116 G 7, 65°15'N, 138°41'W) (87). Soil geochemistry was also done on the KIWI claims (116 B 10, 15, 64°45'N, 138°46'W) (89). Sphalerite, galena and barite are found in vein and breccia zones in Proterozoic dolomites.

Gold-Silver

Whitehorse Mining District

Exeter Mines Limited and *Canex Placer Limited* conducted EM surveys, bulldozer trenching and 4,041 feet of drilling in 21 holes on the Tinta Hill

property (115 I 7, 62°18'N, 136°57'W) located on the south slope of Granite Mountain, 25 miles northwest of Carmacks (73). The property is underlain by a granodiorite to quartz diorite intrusion which is cut by a series of shear zones. Quartz veins in the shear zones contain galena, sphalerite, pyrite and malachite.

Dynasty Explorations Limited carried out a program of geological mapping, soil geochemistry, ground magnetometer surveys, trenching and diamond drilling on the Mount Freegold (90) property (115 I 6, 62°17'N, 137°09'W) owned jointly by *Fred Guder*, *Prism Resources* and *Eldon Campbell*. Gold mineralization occurs in siliceous zones at the contact of quartz-feldspar porphyry dikes and Yukon Group quartz-feldspar-chlorite gneiss and in magnetite-chlorite-epidote skarns within the Yukon Group.

Rayrock Mines Limited and *Discovery Mines Limited* carried out soil geochemistry on the LA FORMA claims (90), located on the southwest slope of Mount Freegold (115 I 6, 62°16'N, 137°07'W). Gold is present in quartz veins in shear zones in granitic rocks.

Welcome North Mines Limited prospected on the SHEEP claims (91), about 38 miles southwest of Whitehorse (105 D 5, 60°21'N, 135°51'W). Assays of grab samples from a quartz vein show gold and silver values of up to 0.45 and 39.0 ounces per ton respectively. Host rock for the vein is a porphyritic volcanic.

Tungsten

Mayo Mining District

Amax Northwest Mining Company Limited carried out preliminary environmental baseline studies on the MacMillan Tungsten property (105 O, P, 63°17'N, 130°07'W) situated on the Yukon-N.W.T. border north of the Canol Road (68). By the end of the season a preliminary engineering feasibility study was underway. Tungsten occurs as scheelite in pyroxene skarn in Lower Paleozoic limestones on the eastern edge of the Selwyn Basin, adjacent to a Cretaceous quartz monzonite stock. The deposit is estimated to contain 30 million tons of 0.9 per cent tungsten trioxide.

Union Carbide Exploration Corporation carried out reconnaissance prospecting in the Mayo area (92).

Northern Natural Resources and Environment Branch

The Northern Affairs Program of the Department of Indian Affairs and Northern Development was reorganized in 1973 to provide the structure necessary to efficiently carry out the Department's responsibilities within the framework of the government's northern policy. As part of this program and in line with the federal government's objectives, the Northern Natural Resources and Environment Branch is responsible for establishing appropriate resource and economic development programs while protecting and conserving the northern environment.

Branch responsibilities include searching and identifying all possible ways and means of expanding the northern economy at a more rapid pace, developing a broad plan of economic progress and recommending specific programs and policies for achieving these objectives.

Measures have been taken to ensure that the environment of the Canadian North is protected and to allow development to proceed at a reasonable rate. These measures are designed to balance environmental protection with developmental activities.

To meet objectives, the government has instituted a number of assistance programs to help the mineral industry overcome some of the high costs of operating in the North. These programs, which are the responsibility of the Northern Policy and Program Planning Branch, include the Northern Mineral Exploration Assistance Program, Prospectors' Assistance Program, Road and Airstrip Assistance Programs and Assay Services. In addition, financial support is given to organizations like Chambers of Mines and Accident Prevention Associations which assist in northern mineral development.

In order to discharge its functions, the Northern Natural Resources and Environment Branch is subdivided into an Oil and Minerals Division and a Water, Lands, Forests and Environment Division.

This publication provides details of mining activity north of 60°. Since the management of mining lands in this region rests with the Oil and Minerals Division, its responsibilities, especially those of the Mining Section, are described in more detail on the following pages.

Oil and Minerals Division

The Oil and Minerals Division of the Northern Natural Resources and Environment Branch is responsible for the management and administration of Crown mineral rights in the Yukon and Northwest Territories.

The Division has the responsibility of formulating and recommending policies designed to encourage resource exploration and development, including the terms of disposal of mineral rights. It also plans and assesses programs designed to provide an adequate infrastructure so that the natural resources, when found, can be properly developed and delivered to the market.

Mining Section

This section is responsible for the administration of mining and mineral rights (excluding oil and gas) from the time a claim is acquired to the production stage, including safety in mines. The section comprises three units — Mining Lands, Exploration and Geological Services, and Engineering and Inspection Services. The responsibility for these operations rests with the Administrator of Mining.

Department of Indian Affairs and Northern Development

Minister: Judd Buchanan, Ottawa, Ontario

Deputy Minister: A. Kroeger, Ottawa, Ontario

Assistant Deputy Minister: A.D. Hunt, Ottawa, Ontario

Northern Natural Resources and Environment Branch

Director: F.J. Joyce, Ottawa, Ontario

Regional Director (Y.T.): B.J. Trevor, Whitehorse, Y.T.

Regional Director (N.W.T.): B. Ritchie, Yellowknife, N.W.T.

Oil and Minerals Division

Assistant Director: H.W. Woodward, Ottawa, Ontario

Mining Section

Administrator of Mining: J.M. Patterson, Ottawa, Ontario

Mining Lands Unit

Head: T.W. Dent, Ottawa, Ontario

Supervising Mining Recorder: B.R. Baxter, Whitehorse, Y.T.

The original Faro mine staking crew seen here at the Vangorda cabin on December 17, 1964.



Mining Recorders: B.C. Thompson, Ottawa, Ontario
W.G. Trew, Whitehorse, Y.T.
O.C. Paton, Dawson, Y.T.
R. G. Ronaghan, Mayo, Y.T.
....., Watson Lake, Y.T.
R.L. Williams, Yellowknife, N.W.T.

Engineering and Inspection Services Unit
Chief Mining Engineer: S. Homulos, Ottawa, Ontario
Regional Mining Engineers: N.G. Needham,
Whitehorse, Y.T.; M.L. Brown, Yellowknife, N.W.T.
District Mining Engineers: E. Bengts,
Yellowknife, N.W.T.
Electrical-Mechanical Engineer: M. Bond,
Whitehorse, Y.T.
Environmental Control Engineer: A. Patrick,
Yellowknife, N.W.T.
Mine Rescue Superintendents: N. Boss, Yellowknife,
N.W.T.; J.D. Barraclough, Whitehorse, Y.T.
Claim Inspectors: G.W. Gilbert, Whitehorse, Y.T.;
D. Cormier, Yellowknife, N.W.T.

Exploration and Geological Services Unit
Head: A.D. Oliver, Ottawa, Ontario
Regional Geologists: D.B. Craig, Whitehorse, Y.T.;
R.W. Hornal, Yellowknife, N.W.T.
Project Geologists: W.A. Padgham,
Yellowknife, N.W.T.; D. Sinclair, Whitehorse, Y.T.
District Geologists: J. Maloney, Whitehorse, Y.T.;
P.J. La Porte, J.M. Seaton, W. Gibbons, J. Murphy,
Yellowknife, N.W.T.
Evaluation Geologist: T.W. Caine, Ottawa, Ontario.

Mining Lands Unit

For administrative purposes, the territories have been divided into seven mining districts. A mining recording staff is responsible for the disposition of mineral rights within each district in accordance with the applicable legislation. For each territory, there is a Supervising Mining Recorder whose principal function is to ensure that uniform practices are observed in the administration of the various mining acts and regulations.

The Nahanni District Recording Office is located at Yellowknife and the Watson Lake Mining Recording Office is continuing to serve as a sub-office for this district. The Arctic and Hudson Bay District Mining Recording Office will be moved to Yellowknife on April 1, 1975 with a sub-office for this district remaining in Ottawa.

The districts and location of Mining Recorders' Offices are as follows:

	District	Office
<i>Yukon Territory</i>	Dawson	Dawson, Y.T.
	Mayo	Mayo, Y.T.
	Watson Lake	Watson Lake, Y.T.
	Whitehorse	Whitehorse, Y.T.
<i>Northwest Territories</i>	Mackenzie	Yellowknife, N.W.T.
	Nahanni	Yellowknife, N.W.T.
	Arctic and	Ottawa, Ont.
	Hudson Bay	Yellowknife, N.W.T.

Mineral claims staked and recorded in the Yukon Territory and Northwest Territories during 1974, with comparative figures for 1973, are tabulated below:

Yukon Territory

District	Claims Recorded	
	1973	1974
Whitehorse	3,119	4,849
Dawson	1,168	1,484
Mayo	2,587	6,038
Watson Lake	2,509	1,325
Total	9,383	13,696

Northwest Territories

District	Claims Recorded	
	1973	1974
Mackenzie	7,158	10,026
Arctic and Hudson Bay	4,836	1,218
Nahanni	3,309	936
Total	15,303	12,180

Engineering and Inspection Services Unit

Headed by the Chief Mining Engineer for the Yukon and Northwest Territories, who is stationed at Ottawa, this unit is responsible for the implementation of the Mining Safety Ordinances and Mining Safety Rules and Regulations in mines as well as the Blasting Ordinance and Regulations in the Yukon and the Explosives Use Ordinance in the Northwest Territories. It is responsible for amendments and the preparation of new safety legislation when required, for maintenance of mine rescue stations and rescue equipment in both territories, and for the training of mine rescue teams.

A Regional Mining Engineer is stationed at Whitehorse in the Yukon and at Yellowknife in the Northwest Territories. He is the senior mining engineer with a staff which includes a District Engineer, Electrical-Mechanical Engineer, Environmental Engineer, Mine Rescue Superintendent, Claim Inspector and clerical staff who are responsible for:

1. Inspection of mines, quarries and blasting operations to ensure compliance with safety legislation.
2. Inspection of mineral claims to ensure compliance with the Yukon Quartz Mining Act, the Yukon Placer Mining Act and the Northwest Territories Canada Mining Regulations.
3. Ensuring that sufficient mine personnel are trained in mine rescue, recovery operations and first aid.
4. Conducting ventilation and dust surveys, monitoring radioactive contamination, and carrying out environmental studies of all underground and surface mining properties.

Mine Rescue

Central Mine Rescue Stations are maintained at Whitehorse, Yukon and Yellowknife, Northwest Territories. Substations are established at each mine. The Department now owns 101 Drager GB-174' four-hour breathing apparatus. It is the policy of the Department to have a minimum of 12 Drager units at each mine so that the mine rescue team can begin a rescue operation before the arrival of trained personnel from the central station.

Mine rescue teams from both territories compete in the Canadian Mine Rescue Championship each year. In 1974, the Department sponsored the Eighth Canadian Mine Rescue Championship which was held at Whitehorse, Yukon Territory. Six teams from British Columbia, Alberta, Saskatchewan, Nova Scotia, Northwest Territories and the Yukon competed. The Eldorado team from Saskatchewan won the competition. In addition, a coal mine team from Kentucky, U.S.A. gave a rescue demonstration.

Mining Safety Statistics – Yukon and Northwest Territories

The U.S.A. Standard Method of Recording and Measuring Work Injury Experience is used in the mining industry in the North. In accidents resulting in death, permanent total disability or permanent partial disability in the northern territories, the number of days recorded as lost-time conforms with the time charges set down in the American Standard.

Disabling injuries are defined by the U.S.A. Standard as being those which result in death, permanent total disability, permanent partial disability or temporary total disability.

Days recorded as lost-time do not include the day of the accident or the day of return to work.

Accident frequency is expressed as the number of accidents per one million man-hours worked.

Accident severity is expressed as the number of days lost due to accidents per million man-hours worked.

Accident Statistics – 1974

In 1974, there were 66 disabling injuries reported in the Yukon Territory. The accident frequency for disabling injuries decreased from 32.25 in 1973 to 25.07 in 1974. Accident severity decreased from 3,136 in 1973 to 741 in 1974. "Fall of persons" was the chief cause of accidents. This was followed by "burns and cuts" and "miscellaneous causes". These three main causes accounted for 56 per cent of all reported accidents. There were no fatal accidents in the Yukon Territory last year.

In the Northwest Territories, 71 disabling injuries were reported in 1974. The accident frequency rate increased from 19.63 in 1973 to 24.37 last year, while the severity rate increased from 3,162 in 1973 to 6,685 in 1974. "Fall of persons" again was the main cause of accidents in the Northwest Territories, accounting for 24 per cent of all accidents. This was followed by "miscellaneous causes", "struck by moving object" and "caught between two objects". These four main causes accounted for 65 per cent of all accidents reported.

Three fatal accidents occurred in the Northwest Territories in 1974. On June 8, 1974, a skiptender was drowned when he was accidentally lowered into water above the bulkhead near the bottom of C-1 shaft at the Con Mine. The other two fatal accidents occurred at Giant Yellowknife Mines Ltd. On March 4, 1974, a stope miner was fatally injured when he fell down a mill-hole and on October 30, 1974, there was one fatality by gassing.

Exploration and Geological Services Unit

This unit provides a geological information and advisory service to the mineral industry in the northern territories. Regional Geologists' offices are maintained at Whitehorse, Yukon and Yellowknife, Northwest Territories.

Two core libraries, the H. S. Bostock library at Whitehorse and the C.S. Lord library at Yellowknife, provide means for preserving valuable diamond-drill core data for the mineral industry. Each has laboratory facilities for core splitting, diamond-saw cutting, thin-section preparation and core storage.

In co-operation with the Geological Survey of Canada, the Yukon Chamber of Mines and the Northwest Territories Chamber of Mines, geoscience forums were held in the fall of 1974 at Whitehorse and Yellowknife. Well attended by the mining and exploration communities, these meetings will be held on an annual basis.

Regional and District Geologists carry out mineral property examinations, collect rocks and mineral specimens and advise the mineral industry, government departments and research scientists on geological problems arising from their work in the territories. The service includes carrying out geological evaluations on mining developments in the Yukon and Northwest Territories whenever government assistance is requested.

Department geologists assist prospectors and other geologists in identifying rock and mineral specimens by giving prospector training courses, in preparing geological compilation maps on mineralized areas and giving direction when requested.

The staff evaluates all geological, geophysical, geochemical and other related work submitted in respect of representation work performed on mineral claims and of work commitments on prospecting permits.

A library of released technical assessment reports is available and a microfilm system allows for material to be copied. A small library containing technical books and mining publications is available at Whitehorse and Yellowknife. Department of Energy, Mines and Resources' publications, such as geological, geophysical and topographical maps, memoirs, papers and reports are offered for sale to the public at the offices.

Maps, papers, reports and open files released by the Exploration and Geological Services Unit are listed in Appendix I of this publication.

Mapping Projects

Summer field surveys and other investigations are carried out under the direction of project geologists. In 1975, the Exploration and Geological Services Unit will prepare geological compilation maps and undertake field checks in the following National Topographic System areas:

Yukon Territory	115-I-11
Northwest Territories	85-J-9, 10 76-F-9, 16 76-K-1, 2 65-H-9, 16 65-I-15 55-L-4

Special Studies

- The special following studies will be carried out:
- a) present and palaeogeomorphology as an aid to the placer mining industry in the Klondike gold field area, Yukon.
 - b) measurements of stratigraphic sections in the Mackenzie Mountains, N.W.T.
 - c) fluid inclusion of zinc-lead deposits in the Yukon and adjacent Northwest Territories.
 - d) composition, variations, marginal features and mode of emplacement of the Clinton Creek Ultramafic Pluton while the mine is still active.
 - e) magnetic and metamorphic history of the Athapuscow Aulacogen, N.W.T.

Prospectors Tom Payne and Pete Davidson look for gold at their Desperation Lake camp in 1939.



Development and Incentive Program Section

The Development and Incentive Program Section is responsible for the administration of policies and development programs designed to stimulate the exploration for non-renewable resources in the Yukon and Northwest Territories.

The government has developed a series of incentive programs designed to aid both companies and individuals in exploration and development activities in the North. These incentives can be broken down into three categories which include the provision of infrastructure, the provision of direct financial assistance, and the provision of technical assistance.

Provision of Infrastructure **Northern Roads Program**

The Northern Roads Program, which was approved by the federal government in 1965, called for an annual expenditure of \$10 million for the following 10 years in both territories. It is the first phase of a long-range, 20-year program designed to bring permanent roads to within 200 miles of all potential areas of resource development. The policy was designed to be sufficiently flexible to allow revisions in priorities from year to year to keep pace with resource development. It also allowed for shift in volume of construction from one territory to another, depending on the requirements and based on northern territorial development.

By 1971, the Northern Roads Policy was revised, modifying construction standards and providing for the Pioneer Resource Roads, thus making available low-cost access into areas of undeveloped natural resource potential.

The new policy reflects the government's approach to northern development for the coming decade, as announced by the Minister in 1972. Essentially, this policy provides for a form of balanced development by which the needs of people are paramount and the environment protected.

In order to achieve the objectives of the Northern Roads Policy, classification of roads was established wherein cost-sharing formulas between federal-territorial-private interests were defined. In this classification, there are two main categories of roads:

- a) communication and network roads and
- b) lateral roads.

a) communication and network roads are those highways and roads which provide a network of roads in the Yukon and N.W.T. and connecting links to the provinces. Their initial cost is borne completely by the federal government, which also bears 85 per cent of maintenance costs while the territorial government bears the remaining 15 per cent. Listed under this category are:

Trunk highways

Secondary trunk roads

Airport roads

Since 1965, when this multipurpose \$100 million, \$10 million-a-year program was commenced, 1,327 miles of new roads at a cost of \$104.767 million have been constructed.

Dempster Highway

The Dempster Highway continued to be identified as the major construction project during 1974. From Mile 0 of the highway, just south of Dawson, Y.T., the system stretches 377 miles to Arctic Red River. The route then proceeds northwest for 40 miles to its junction point with the Mackenzie Highway (Mile 931, Mackenzie Highway). By the end of November, 1974, 178 miles of the Dempster had been completed, following the route north-northeast from Dawson and an additional 35 miles were also completed, linking Fort McPherson with Arctic Red River for a total of 213 miles. Work had also started on the section from Fort McPherson west to the N.W.T.-Y.T. border and north from Arctic Red River.

Mackenzie Highway Program

The Prime Minister announced the acceleration of the construction of the Mackenzie Highway in April, 1972. It is the first major northern construction project that is considering the environment and the immediate and long-term well-being of the local native people as carefully as the construction and engineering factors.

This highway, more than 1,000 miles long, will be an all-weather link from the Alberta-N.W.T. border to the Mackenzie Delta, connecting the communities (hitherto isolated from each other) down the Mackenzie Valley.

Construction

The Mackenzie Highway is complete from Mile 0 (Alberta-N.W.T. Border) 296 miles to Fort Simpson. Between Fort Simpson and Inuvik, 140 miles are currently under construction and in varying stages of completion. In addition, another 150 miles of highway design will soon be completed.

Hire North

Since the beginning of road construction between Fort Simpson and Inuvik, crews of native people have been employed by Hire North to clear the highway right-of-way. A 15-mile training section has been established to instruct native people in highway construction skills. As well as operating this section, Hire North is currently working between Wrigley and Fort Norman.

Environmental Aspects

Numerous studies are underway to consider community impact of the highway, entrepreneurial opportunities, revegetation, inventory on migration of natural species and soil types.

b) Lateral Roads are those roads which lead from a communication or network road to a location where resource exploration, development and exploitation will be carried out in the near future.

Lateral roads are further broken down into two sub-categories – cost-sharing and non cost-sharing.

Cost-sharing roads, as the name implies, are those roads which are constructed by a resource developer and financed jointly by the developer and the government. Included in this sub-category are tote trails, initial access roads and permanent access roads.

Tote trails are constructed by a resource developer and may receive a grant of up to 50 per cent of their construction cost to a maximum contribution of \$20,000. Tote trails provide seasonal or year round access to the property of a company engaged in exploring or developing a natural resource. The Tote Trail Program is administered by the commissioner of each territory.

Initial access roads may receive the same maximum percentage assistance grant as tote trails, but the maximum federal contribution will not exceed \$100,000 for projects of an exploratory nature or

\$500,000 for projects in the development stage. This classification provides for contribution towards more costly roads than those provided for under the Tote Trails Program.

Permanent access roads lead from the nearest permanent road to the location of a resource development that has been brought into full production stage. These roads may receive a federal contribution of up to two-thirds of their cost. However, the maximum contribution may not exceed \$40,000 per mile.

Financial assistance for bridge and access-road construction to date amounts to \$2,350,545.00. The following companies have received assistance:

Arctic Gold and Silver Mines Ltd.

Western Minerals Limited

Anvil Mining Corporation Limited

Hudson Bay Mining and Smelting Co. Ltd.

Venus Mines Limited

Mount Nansen Mines Ltd.

New Imperial Mines Ltd.
(now Whitehorse Copper Mines Ltd.)

Canoe River Exploration Ltd.

J. Ray McDermott Canada Ltd.

Inexco Oil Co. Ltd.

Northern Resource Airports Program

This program terminated on March 31, 1974, in accordance with the terms of Treasury Board Minute No. 719903 dated August 23, 1973. However, the modification of this program and the review of other northern development programs and policies are being considered to ensure that the means of encouraging resource development in the North is most appropriate.

Remote Airports Program

This program was designed to provide major settlements with gravel all-weather airstrips 3,300 feet in length, capable of meeting the essential educational, health and emergency requirements of the community. Since its inception in 1969, airports have been constructed at Coppermine, Whale Cove and Pangnirtung in the N.W.T. and Old Crow in the Y.T.

The effectiveness of this program has been outdistanced by changes in aircraft type and increasing community requirements. Further, the program neither provides for airport lighting, communications and other air transportation facilities, nor does it provide for runway improvement to meet the needs of modern turbine-engined aircraft now landing in the Canadian Arctic.

A new policy has recently been established to provide improved air transportation facilities and services at northern communities. These facilities will include all those normally found at similar airports in southern Canada.

Under the new policy, the Ministry of Transport will have overall responsibility for the construction, operation and maintenance of all airports, air navigation aids, and associated facilities and services. However, the actual site operation of these airports will be undertaken by the territorial governments which will employ community residents to the greatest extent possible.

The improved air transportation facilities would enable the use of larger, more productive turbine-engined aircraft and should lower transportation costs to communities now served by small aircraft.

Provision for Direct Financial Assistance

Northern Mineral Exploration Assistance Program

This program is designed to encourage mineral exploration activity in the Yukon Territory and Northwest Territories. Assistance in respect of one or more exploration programs for a single applicant is limited in aggregate to \$100,000 but cannot exceed 40 per cent of the approved cost of an exploration program. A total of 136 corporate applicants have

applied for assistance in one or more exploratory work programs.

Since the inception of the program in 1967, 210 applications have been approved and a total of \$4,231,810.32 has been paid in grants, leaving an outstanding commitment of \$902,822.00. Moreover, payments of \$9,022,500 have been made towards a large portion of oil and gas exploration in the Arctic Islands through Panarctic Oils Ltd.

Prospectors' Assistance Program

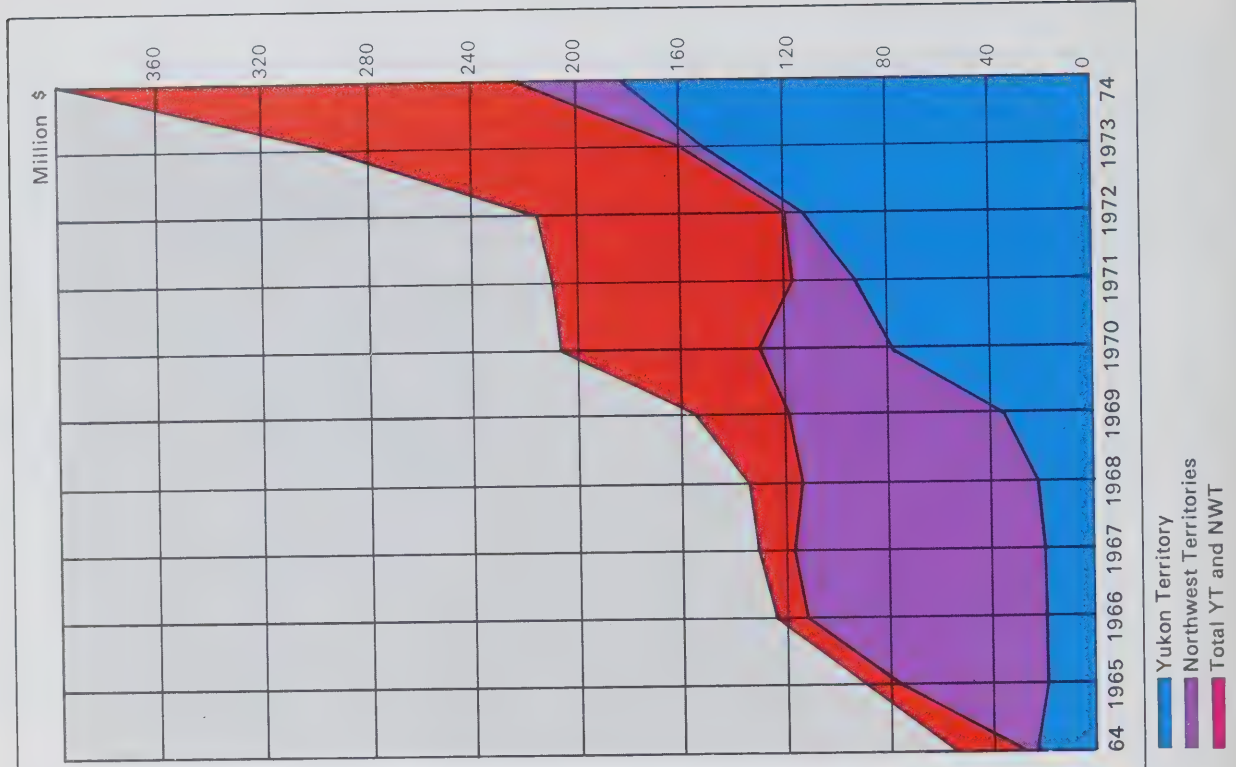
In both the Yukon Territory and Northwest Territories, a combined amount of \$70,000 is available in the form of grants to aid prospectors in their search for mineral deposits. A prospector may receive up to \$900 each year to help finance his prospecting venture. The program has been well received since its introduction in 1962 and has been instrumental in the location of several mineral discoveries. During 1974, \$30,000 was committed to 37 prospectors in the Northwest Territories and \$20,433.40 to 30 prospectors in the Yukon Territory.

Provision of Technical Assistance

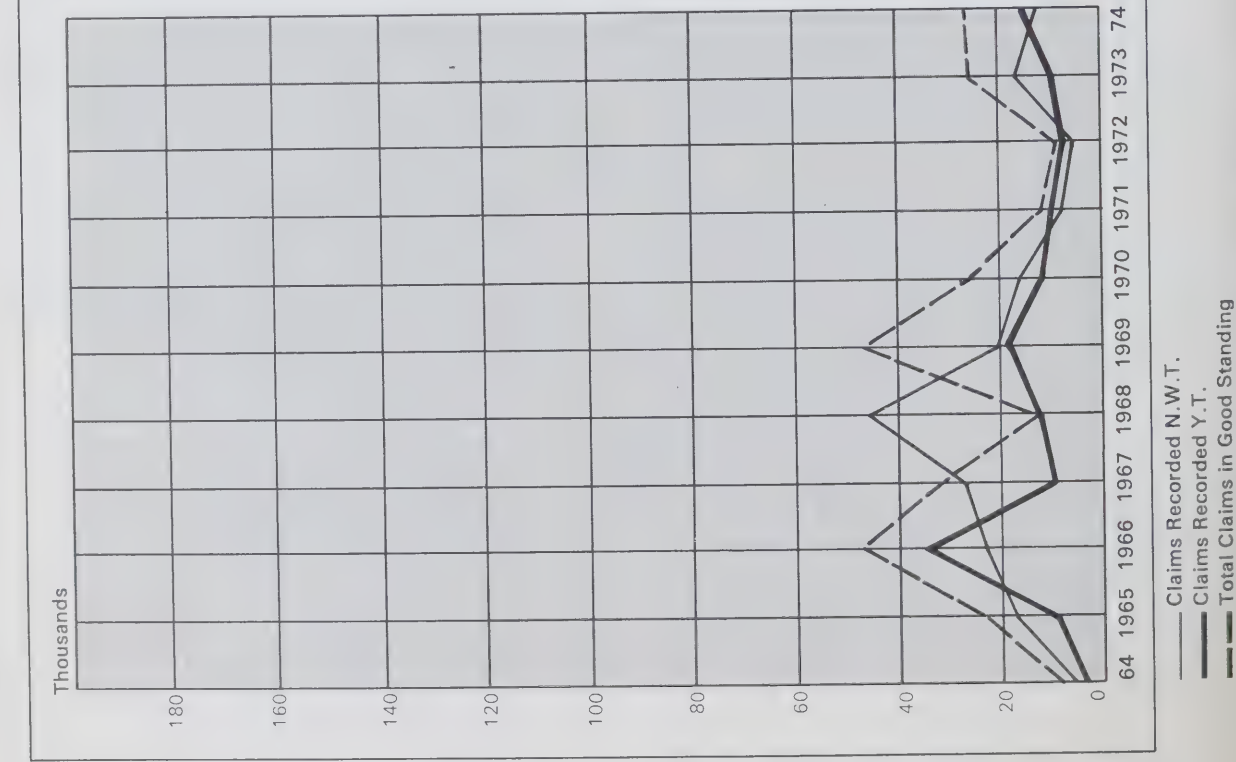
Assay Service

There were approximately 3,901 assays (representing a value of \$15,085.75) performed during 1974 at the Government Assay Office at Yellowknife. In the Yukon Territory the federal government pays 50 per cent of the cost of 10 assays per year for each prospector submitting samples for analysis. In addition the government pays full cost of assays submitted by prospectors working under the Prospectors Assistance Regulations. During 1974 the total cost of this service was \$3,001.00 for 142 assays at half cost and 93 assays at full cost.

Value of Production



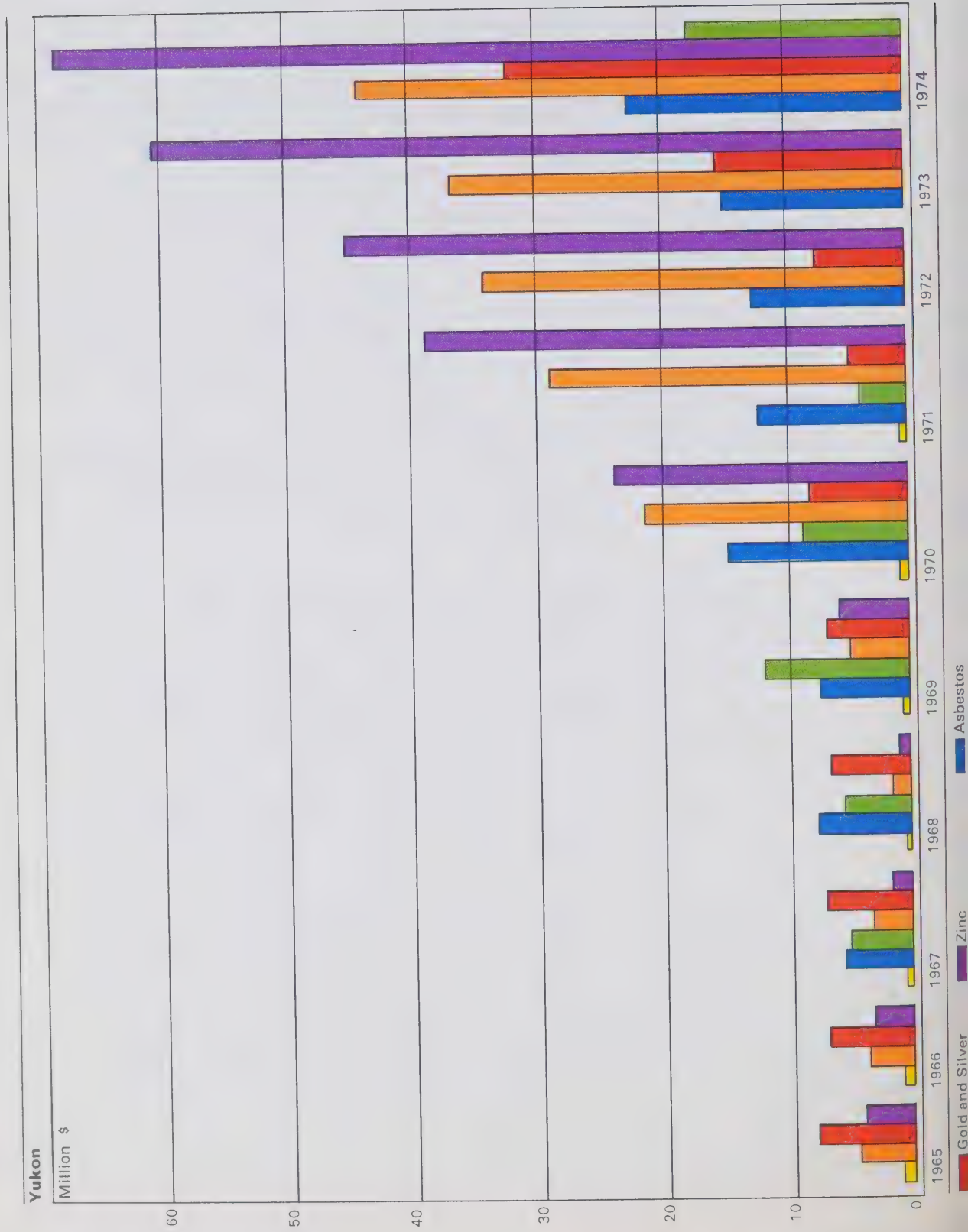
Mineral Claims Recorded



Mineral Production Chart
1965 to 1974

Northwest Territories												
Mineral		1965	1966	1967	1968	1969	1970	1971	1972	1973	1974(a)	Cumulative Total(b)
Gold	\$ ounces	17 071 580 452,479	15 990 133 424,029	14 356 476 380,304	13 285 459 352,306	12 381 240 328,502	12 168 776 332,844	10 897 934 308,339	17 713 250 307,479	24 262 894 249,075	27 634 000 177,000	371 830 307
Silver	\$ ounces	1 430 754 1 064 824	2 325 407 1 662 192	3 429 755 1 980 228	8 677 365 3 751 563	3 910 888 2 026 367	5 114 587 2 764 642	4 574 616 2 932 446	6 778 965 4 059 261	13 691 789 5 420 344	19 621 000 4 252 000	71 557 598
Copper	\$ pounds	354 342 942 400	672 065 1 496 805	538 077 1 131 126	833 169 1 732 160	643 761 1 251 723	766 578 1 320 502	727 595 1 378 021	577 416 1 133 767	1 106 319 1 734 178	1 190 000 1 528 000	8 835 271
Nickel	\$ pounds											12 850 205
Lead	\$ pounds	25 677 695 165 662 547	31 472 562 210 659 720	35 665 535 254 753 820	33 636 984 250 275 180	32 299 014 212 913 740	37 842 405 239 206 099	22 629 795 167 628 110	27 838 277 180 439 960	32 261 787 199 887 160	37 977 000 183 464 000	318 124 323
Zinc	\$ pounds	28 596 474 189 380 626	57 128 344 378 333 400	60 852 900 419 964 800	57 504 129 407 830 700	68 275 481 448 296 000	76 004 563 477 115 900	75 056 384 448 633 500	64 792 006 339 741 000	87 541 226 362 549 600	136 467 000 391 025 000	713 329 523
Uranium (d)	\$ pounds											79 477 897
Cadmium	\$ pounds	516 635 185 840	2 769 372 1 073 400	2 551 920 911 400	774 060 271 600	675 136 191 800	737 632 207 200	301 476 155 400	205 436 81 200	61 152 16 800	158 000 40 000	8 750 819
Bismuth	\$ pounds						3 072 490	41 149 7 578				44 221
Tungsten	\$ pounds											
Total	\$	73 707 480	110 357 883	117 394 663	114 711 166	118 185 520	132 637 613	114 228 949	117 905 350	158 925 167	223 047 000	1 584 800 174
Yukon Territory												
Gold	\$ ounces	1 698 975 45 031	1 639 103 43 466	675 725 17 900	911 338 24 167	1 118 715 29 682	653 034 17 862	511 534 14 473	234 983 4 079	2 032 502 20 865	4 130 000 26 000	274 680 855
Silver	\$ ounces	6 462 393 4 615 995	5 868 217 4 194 580	6 701 756 3 869 374	4 806 384 2 077 987	5 182 166 2 685 060	7 845 312 4 240 709	8 966 417 5 747 703	8 331 575 4 988 967	15 342 856 6 073 973	28 420 000 6 158 000	207 143 090
Lead	\$ pounds	2 766 953 17 851 309	2 386 684 15 975 125	2 141 959 15 299 709	970 629 7 221 940	4 256 183 28 056 581	20 830 196 131 670 010	29 340 379 217 336 142	34 392 366 222 921 742	38 013 324 235 522 452	44 010 000 212 609 000	227 139 267
Copper	\$ pounds			3 409 779 7 167 919	5 097 157 10 597 000	7 645 623 14 866 077	9 148 995 15 760 000	2 709 696 5 132 000	890 286 1 748 093	14 791 665 23 186 245	17 605 000 22 600 000	64 399 984
Coal	\$ tons	85 626 8 801	46 390 5 670	15 791 1 912		6 039	10 908	21 026	18 435	19 601	17 027	2 567 132
Zinc	\$ pounds	2 000 396 13 247 653	1 729 027 11 450 510	1 373 151 9 476 545	748 206 5 306 429	5 035 385 33 062 280	24 845 216 155 964 948	39 003 342 233 134 144	45 241 287 237 225 560	61 167 027 253 321 575	68 576 000 183 344 000	278 353 881
Cadmium	\$ pounds	386 192 138 918	306 336 118 735	265 997 94 999	147 716 51 830	239 965 68 172	261 528 73 463	114 654 59 100	82 759 32 711	45 718 12 560		6 344 235
Asbestos	\$ tons			406 371 2 260	8 684 125 63 592	11 924 526 87 437	13 927 652 105 638	12 374 380 91 969	13 006 476 101 888	13 915 140 100 734	22 300 000 90 000	96 538 670
Nickel	\$ pounds								3 996 762 2 814 621	5 209 621 3 404 981		9 206 383
Platinum	\$ ounces								325 573 3 625	149 458 1 314		475 031
Total	\$	13 400 535	11 976 757	14 990 529	21 365 555	35 402 563	77 511 933	93 020 402	106 502 067	150 667 311	185 041 000	1 166 848 528
(a) Preliminary Figures												
(b) Cumulative Totals — 1932 to December 31, 1974												
(c) Cumulative Totals — 1886 to December 31, 1974												
(d) Figures for years 1932, 1943 to 1953 not available (Figures for tungsten not available)												

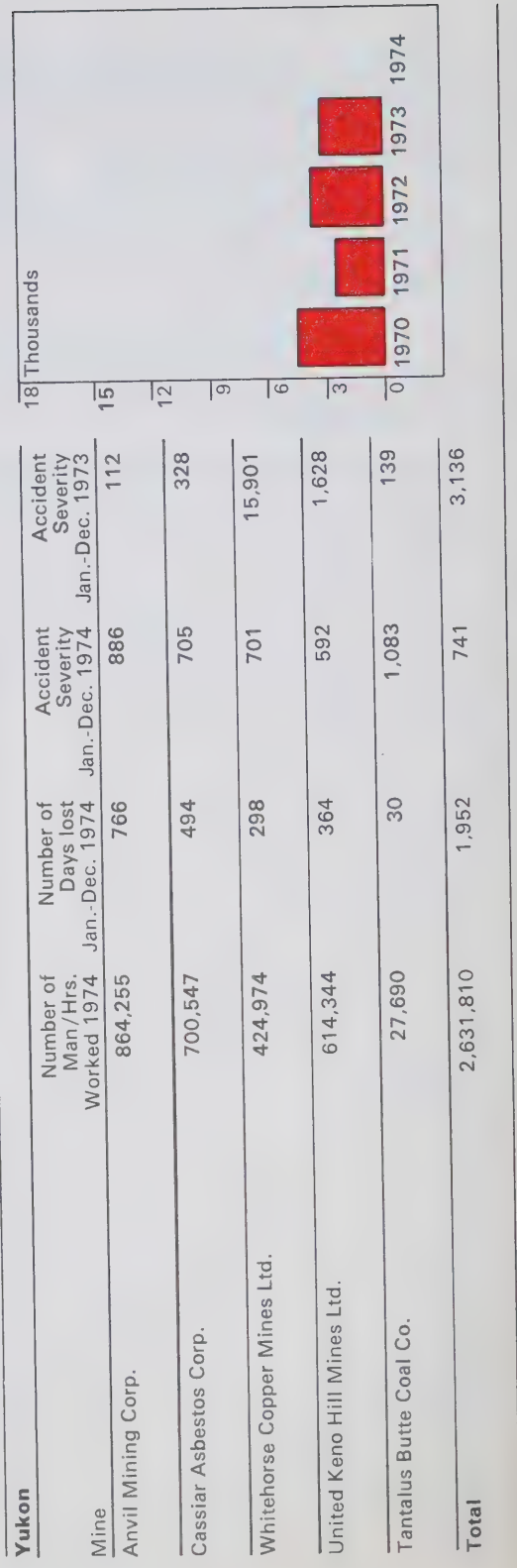
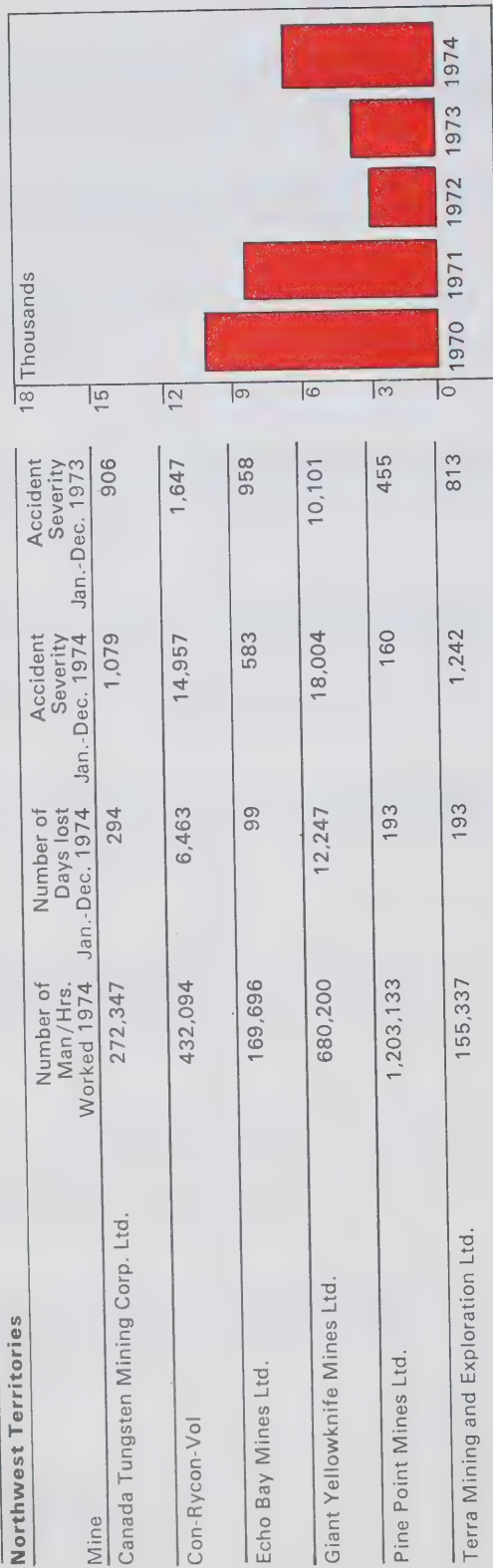
44 Value of Mineral Production



Value of Mineral Production



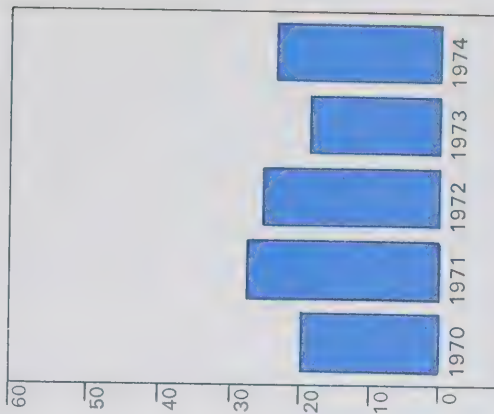
Mining Accident Severities



Mining Accident Frequencies

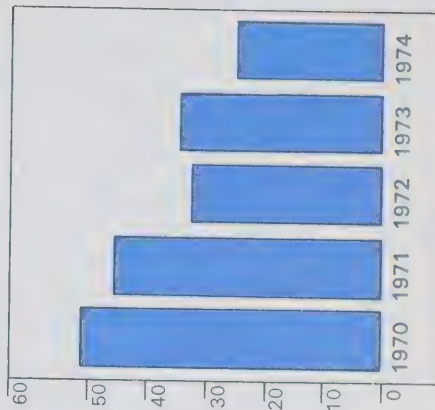
Northwest Territories

Mine	Number of Man/Hrs. Worked 1974	Number of Accidents Jan.-Dec. 1974	Accident Frequency Jan.-Dec. 1974	Accident Frequency Jan.-Dec. 1973
Canada Tungsten Mining Corp. Ltd.	272,347	12	44.06	19.28
Con-Rycon-Vol	432,094	10	23.14	31.08
Echo Bay Mines Ltd.	169,696	14	82.50	52.98
Giant Yellowknife Mines Ltd.	680,200	18	26.46	10.83
Pine Point Mines Ltd.	1,203,133	5	4.15	4.43
Terra Mining and Exploration Ltd.	155,337	12	77.25	83.97
Total	2,912,807	71	24.37	19.63



Yukon Territory

Mine	Number of Man/Hrs. Worked 1974	Number of Accidents Jan.-Dec. 1974	Accident Frequency Jan.-Dec. 1974	Accident Frequency Jan.-Dec. 1973
Anvil Mining Corp.	864,255	28	32.40	7.18
Cassiar Asbestos Corp.	700,547	11	15.70	7.71
Whitehorse Copper Mines Ltd.	424,974	6	14.11	95.47
United Keno Hill Mines Ltd	614,344	19	30.93	44.11
Tantalus Butte Coal Co.	27,690	2	72.23	34.95
Total	2,631,810	66	25.07	32.25



Causes of Disabling Injuries in Mines

	Drilling	Caught between two objects	Strain while lifting	Fall of persons	Struck by moving object	Foreign matter in eyes	Tramming cars	Gassing	Fall of rock	Falling object	Blasting	Burns and Cuts	Miscellaneous	Total
Northwest Territories														
Canada Tungsten Mining Corp. Ltd.			1	4	4	1				1			1	12
Con-Rycon-Vol				3	1	1		1	1	1			2	10
Echo Bay Mines Ltd.		3	2	2	1				2			2	2	14
Giant Yellowknife Ltd.		2	2	4	4			1	1				4	18
Pine Point Mines Ltd.				1					1			2	1	5
Terra Mining and Exploration Ltd.		2	1	3		2			1	1			2	12
Total		7	6	17	10	4		2	6	3		4	12	71

Yukon Territory														
Anvil Mining Corp.		2	2	5		8				1		7	3	28
Cassiar Asbestos Corp.		2	1	1								2	5	11
Whitehorse Copper Mines Ltd.				2	1				1			2		6
United Keno Hill Mines Ltd.			2	7		1			5	3			1	19
Tantalus Butte Coal Co.				1									1	2
Total		4	5	16	1	9			6	4		11	10	66

Appendix I

List of Publications

Exploration and Geological Services D.I.A.N.D.

Books

Mineral Industry Report, 1969-70, Vol. 1, Yukon Territory and Southwestern Sector, District of Mackenzie; by D. B. Craig and P. J. Laporte, EGS 1972-1. \$2.00

Mineral Industry Report, 1969-70, Vol. 2, Northwest Territories east of 104° west longitude; by P. J. Laporte, EGS 1974-1. \$2.00

Mineral Industry Report, 1971-72, Vol. 1, Yukon Territory; by D. B. Craig and M. W. Milner, EGS 1975-6. \$3.00

Mineral Industry Report, 1971-72, Vol. 2, Northwest Territories east of 104° west longitude; by P. J. Laporte, EGS 1974-2. \$2.50

Mineral Industry Report, 1971-72, Vol. 3, Northwest Territories west of 104° west longitude; by W. A. Padgham, M. W. Kennedy, C. W. Jefferson, D. R. Hughes and J. D. Murphy, EGS 1975-8. \$3.00

Mineral Industry Report, 1973, Yukon Territory; by W. D. Sinclair and G. W. Gilbert, EGS 1975-7. \$3.00

Mineral Industry Report, 1973, Northwest Territories; by J. B. Seaton, J. D. Murphy, P. J. Laporte and W. A. Gibbons, EGS 1975-9. (\$3.00, in press)

Lake-Sediment geochemical sampling survey in the following areas: Yellowknife, Indin Lake and portion of the Cameron River and Beaulieu River Greenstone Belts; by D. Nickerson, G.S.C. Open File 129, 1972. \$12.00

Maps

Preliminary geology map of Camsell River Silver District, scale five inches to one mile; by R. J. Shegelski and J. D. Murphy, G.S.C. Open File 135, 1973. \$3.50

Preliminary geology map of Rainy Lake, N.W.T., 86E/9, scale 1:31,680; by J. D. Murphy, G.S.C. Open File 135, 1973. \$1.00

Preliminary geology map of Rankin Inlet, 55K/16, scale 1:31,680; by P. J. Laporte and S. K. Frape, G.S.C. Open File 179, 1973. \$1.00

Preliminary geology map of White Eagle Falls, N.W.T., 86F/12, scale 1:31,680; by W. A. Padgham, G.S.C. Open File 199, 1974. \$1.00

Preliminary geology map of High Lake, N.W.T., 76M/7, scale 1:31,680; by W. A. Padgham, G.S.C. Open File 208, 1974. \$1.00

Geology of Two Base-Metal Deposits (High Lake and Indian Mountain deposits) in the Slave Structural Province; by W. Johnson, 1974. \$4.00

Preliminary geology maps of Hackett River area, N.W.T., scale 1:31,680; by W. A. Padgham, C. W. Jefferson, E. A. Ronayne, V. Z. Sterenberg and D. Bryan.

E.G.S. Map 1975-1; 76-G-13
E.G.S. Map 1975-2; 76-G-12
E.G.S. Map 1975-3; 76-G-5
E.G.S. Map 1975-4; 76-F-9
E.G.S. Map 1975-5; 76-F-16
\$1.00 per map

Papers

Copies of the following papers are available at the Regional Geologist's Offices or in Ottawa:

A Review of Mineral Exploration in the Keewatin District, Northwest Territories; by P. J. Laporte, 1972. Presented at the Northwest Territories Chamber of Mines Exploration Symposium, Yellowknife, N.W.T., February 1972.

Highlights of Mining Exploration in Northern Canada for 1973; by R. W. Hornal and D. B. Craig. Paper presented at the Prospectors' and Developers' Association Convention, Toronto, Ontario, 1974.

Exploration for Lead-Zinc in the Selwyn and Mackenzie Mountains, Yukon and Northwest Territories; by J. D. Murphy and W. D. Sinclair. Paper presented at the Prospectors' and Developers' Association Convention, Toronto, Ontario, 1974.

Mineral Potential of the Northwest Territories; by W. A. Padgham. Published in the Geology of Canadian Arctic; Editors: J. D. Aitken, D. J. Glass. Special publication of the C.S.P.G. and G.A.C., 1974.

Potential for Large Tonnage Mineral Deposits in a Selected Area (65° to 74°N, 80° to 120°W) of the Northwest Territories; by J. M. Seaton. Paper presented to CIM western meeting, Winnipeg, Manitoba, 1974.

Lead-Zinc Mineralization in the Central Dolomite Belt of the Lower Cambrian Sekwi Formation; by W. J. Crawford. Paper presented at Geoscience Forum, Yellowknife, N.W.T., 1974.

Lake Sediment Geochemistry as a Guide to Detection of Massive Sulphide Deposits in the Southern Slave Province; by R. G. Jackson and I. Nichol. Paper presented at Geoscience Forum, Yellowknife, N.W.T., 1974.

Abstracts of the N.W.T. Chamber of Mines Exploration Symposium; by Exploration and Geological Services, Yellowknife, N.W.T., February, 1972.

Northern Canada Mineral Exploration 1972; by P. J. Laporte, W. A. Padgham and D. B. Craig. Paper presented at the Prospectors' and Developers' Association Convention, Toronto, Ontario, 1973.

Mineral Exploration North of 60°, Trends and Achievements; by R. W. Hornal and D. B. Craig. Paper presented at the Prospectors' and Developers' Association Convention, Toronto, Ontario, 1971.

A Critical Review of Northern Mineral Potential; by D. B. Craig and J. A. Kelly. Paper presented at the Prospectors' and Developers' Association Convention, Toronto, Ontario, 1970.

Activity Reports

Mines and Mineral Statistics, North of 60 (published monthly and includes claim staking and production statistics for Yukon and N.W.T.).

Mines and Minerals Activities, North of 60 (published yearly and includes summaries of exploration and mining activities for Yukon and N.W.T.).

Indexes

(produced by Canadian Centre for Geoscience Data for D.I.A.N.D.)

Index of Mineral Claim Assessment Work Reports by National Topographic System on file in Ottawa, Yellowknife and Whitehorse.

Index of Assessment Work by Concept on file in Ottawa, Yellowknife and Whitehorse.

Index of Geological Reports and Maps by National Topographic System of the Yukon and Northwest Territories. Includes work on file by: Mining and Oil & Gas, D.I.A.N.D.; E.M.R.; and other agencies.

Preliminary Studies

The following preliminary reports are on open file at Ottawa and at the Regional Geologists' offices in Yellowknife, N.W.T. and Whitehorse, Y.T.

- 1) Preliminary Study on Metal Dispersion Patterns in Lake Sediments and the relationship to mineralization in the Yellowknife and Indin Lake areas; by R. G. Jackson, Exploration Geochemistry Group, Department of Geological Sciences, Queen's University, 1973.
- 2) Study of Coal in the Yukon; by D. B. Craig and M. J. Milner, 1973.
- 3) Coal Deposits in the Arctic Archipelago, N.W.T.; by T. W. Caine, 1973.
- 4) Soapstone Deposits of the N.W.T.; by J. D. Murphy, 1973.
- 5) Mineral Occurrence Overlays for geological maps in the western District of Mackenzie, NTS 75, 76, 85, 86, parts of 77, 87, 95, 96 and 105.

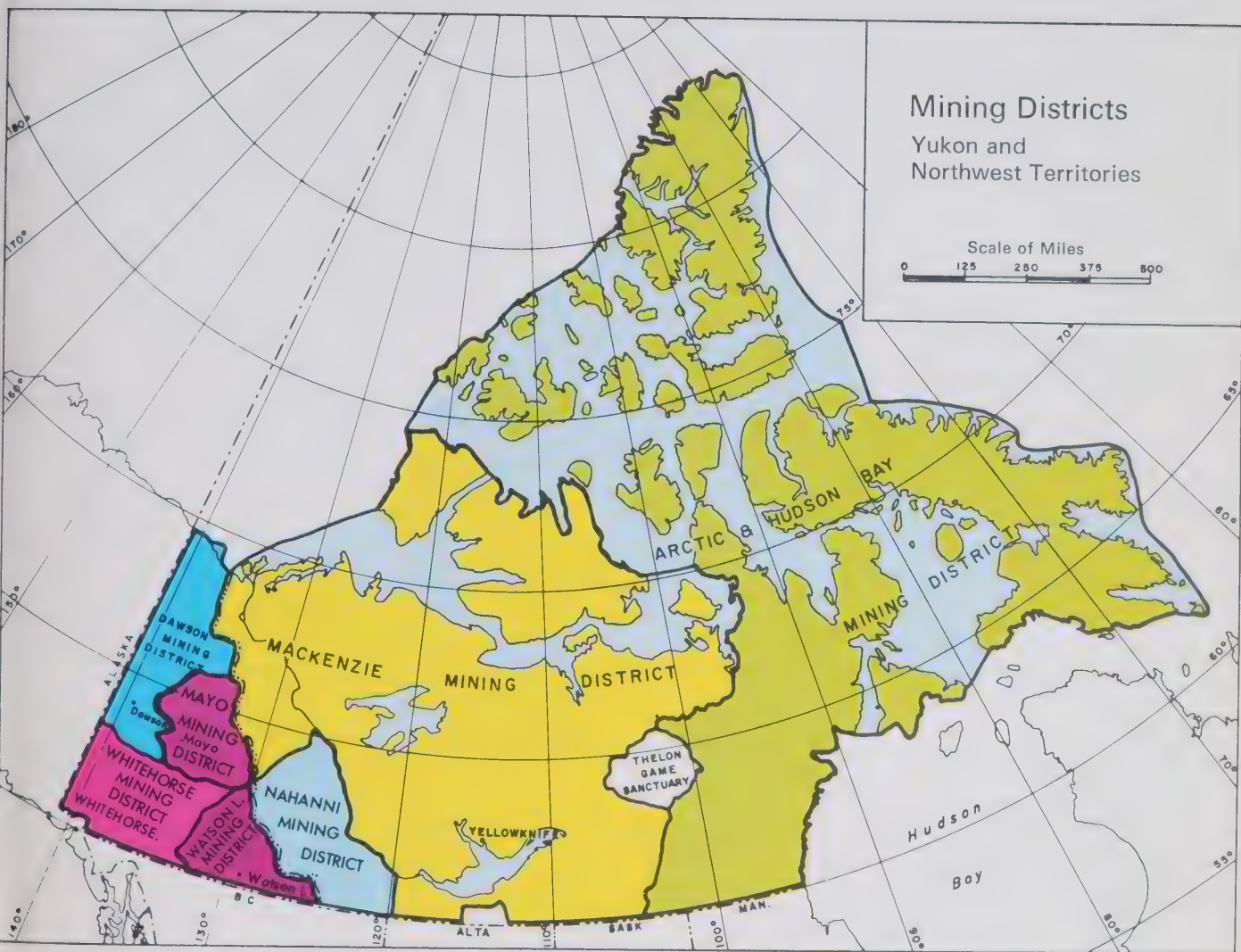
Papers in Preparation

Preliminary copies of these manuscripts can be examined at Ottawa and the Regional Geologists' offices in Yellowknife, N.W.T. and Whitehorse, Y.T.

- 1) Mineral Industry Report 1969-70, Vol. 3, Northwest Territories west of 104° west longitude.
- 2) Mineral Industry Report 1974, Yukon Territory.
- 3) Mineral Industry Report 1974, Northwest Territories.

Preliminary copies of the following can be examined at the Regional Geologist's office, Yellowknife.

- 4) Geology compilation of Beniah Lake, 85-P-8.



Photos used throughout this report courtesy of:

Jane Gaffin

Yukon Chamber of Mines

Photograph Collection, Suzzallo Library,

University of Washington, Seattle

Northwest Territories Chamber of Mines

Charles J. Brown

John Brock

Mrs. R. Leech

Cominco Ltd.

Public Archives

Jack Everett

Early Days on the Yukon,

William Ogilvie, Thorburn & Abbott



Indian and
Northern Affairs

Affaires indiennes
et du Nord

North of 60

Mines and Minerals Activities 1975

1
161
M35



Mines and Minerals Activities 1975

Government
Publications



Mount Cairnes exemplifies the rugged Yukon terrain which first challenged the gold seekers, the map makers, geologists and engineers. (GSC 123589)

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Introduction

The mining industry North of 60 in 1975 again played an important role in the development of Canada's northern territories in both its contribution to the local economies and by its increased production.

The industry contributed more than \$65 million to the economies of the Yukon and Northwest Territories. This money included salary and wages, payment for goods and services purchased locally, and payment of local taxes.

The mining industry also paid \$8,958,245.55 to the federal government last year in royalties on 1974 mining activities under the terms of the Canada Mining Regulations for the Northwest Territories and the Yukon Quartz Mining Act for the Yukon.

During the year, the value of mineral production in Canada's northern territories increased over 1974. It was down 15.2 per cent to \$181,787,000 over 1974 in the Northwest Territories and up 33.5 per cent to \$228,659,000 in the Yukon.

Compared to 1960, the value of mineral production in the N.W.T. in 1975 represented a 1,009 per cent increase while the increase in the Yukon during the 15-year period stood at 915 per cent. During the same period, the value of mineral production in Canada increased 537.6 per cent.

Production of the N.W.T. came from one open-pit and six underground mines which together produced lead, zinc, copper, gold, silver, cadmium and tungsten. The Yukon's production came from three underground mines and two open-pit mines which together produced lead, zinc, copper, silver, asbestos and coal. Lead-zinc accounted for 78 per cent of the total value of production in the N.W.T. and 66 per cent in the Yukon.

The Yukon was the largest producer of lead in Canada and the N.W.T. was second. The combined production of both territories was 428,021,000 pounds valued at \$87,101,000. Production of all minerals, with the exception of zinc, was down in the N.W.T. The number of persons employed by the producing mines increased by 210 to 1,583 persons.

Gold, copper and cadmium production were down in the Yukon but all other minerals were up. As in the N.W.T. the number of persons employed by the mines increased by 79 to 1,335 persons.

Mineral exploration expenditures in the N.W.T. in 1975 amounted to approximately \$25 million, up about 39 per cent from the previous year.

There were 22,811 mineral claims recorded in the N.W.T. in 1975. In addition, 68 prospecting permits were granted covering approximately twelve million acres of land. This was an increase of 29 permits over 1974.

Exploration expenditures in the Yukon amounted to approximately \$16 million in 1975, an increase of 25 per cent over the previous year.

There were 8,569 claims recorded in the Yukon, a decrease of 5,127 over 1974.

The third annual geoscience forums were held in Whitehorse and Yellowknife in early December with over 400 persons in attendance representing industry, federal and territorial governments and academic institutions.

Highlights of 1975:

- ☐ Western Mines Ltd. and Dupont of Canada Ltd. discovered high-grade lead-zinc mineralization west of Pine Point.
- ☐ Texasgulf Canada Ltd. drilled its new copper-zinc deposit at Izok Lake which contains over seven million tons of 3.15 per cent copper, 14.8 per cent zinc, 1.2 per cent lead and 1.85 ounces silver per ton. Twenty-five miles north of Izok Lake, drilling continued on the Hood River deposits where approximately one million tons of copper-zinc-silver mineralization have been found.
- ☐ Shell Canada Ltd. drilled its stratiform copper deposit in the Redstone River area, N.W.T. This area was the scene of a small staking rush caused by the release of GSC Open File #298. Redstone Resources Ltd. and Welcome North Mines Ltd. had discovered and staked copper mineralization previously.
- ☐ Diapros Canada Ltd. continue to explore the kimberlites of Somerset Island for diamonds.
- ☐ Manalta Coal Ltd. and Luscar Ltd. are exploring the Brackett Basin in the Fort Norman area, N.W.T. where the potential for large coal reserves is believed to exist.

- ☐ Extensive work was conducted on the Kerr Addison — AEX Grum property near Ross River. The deposit is thought to contain 30 million tons of 10 per cent lead-zinc and nearly two ounces of silver per ton.
- ☐ Canex Placer Ltd. continued to delineate its large lead-zinc deposit at Howard's Pass on the Yukon - N.W.T. border.
- ☐ Barrier Reef Resources Ltd. further drilled its Goz Creek deposit where 12 million tons of eight per cent zinc has been indicated.
- ☐ Claymore Resources Ltd. discovered extensive placer gold deposits near the Yukon-Alaska border.
- ☐ Several barite deposits were staked and mapped in the Hess Mountains of which the TEA property of Welcome North Mines Ltd. seems to be the most promising.



Salute to Engineers and Geologists

R. G. McConnell on the Peel River in 1888. (GSC 9485)



The discovery and mining of mineral deposits in remote areas of Canada's North have been outstanding achievements of this century. Problems in transportation, construction and mine operations, along with difficulties caused by extreme climate and permafrost conditions, had to be overcome. It is thanks to the geologists and engineers that these physical barriers were conquered.

Highly trained in the science of geology, geologists examine the rocks which make up the earth's crust and their association with each other and concentrations of mineralization. Engineers, on the other hand, plan and manage operations which enable minerals to be taken from the rocks.

The first recorded geological observations, except for a few noted by early explorers and Hudson Bay Company employees, were those made by officers of the Geological Survey of Canada. G.S.C. men carried out the first reconnaissance exploration of Canada North of 60° in the last half of the 19th Century.

Geologists and explorers like G.M. Dawson and R.G. McConnell first traversed the Yukon Territory and Mackenzie District, while J.B. Tyrrell traversed the west side of Hudson Bay and the barren lands. Robert Bell and A.P. Low explored the east side of the Hudson Bay area, with Low commanding the first Canadian expedition to assert Canada's authority on the Arctic Islands and waters. On August 11, 1904, he took possession of Ellesmere Island on behalf of Canada by raising the flag.

When Dawson and McConnell made their trip to the Yukon district in 1887, William Ogilvie, as Dominion Lands surveyor, mapped the routes into and down the Yukon River to the Alaska border. He then mapped from the Porcupine River in the Yukon to the Mackenzie River and upstream to Great Slave Lake; continuing south his survey connected with the existing Dominion Land Survey.

Ogilvie, as well as McConnell and Tyrrell, returned to the Yukon when the Klondike Gold Rush got underway. Ogilvie, because of his integrity and honesty, was asked by miners to survey placer claims on Bonanza Creek. The fact that no one disputed his survey attests to the reputation he had among the miners.

In 1898, Ogilvie was appointed Commissioner of the Yukon. It was under his direction that a vast wilderness, peopled by an army of adventurers eager to possess the gold, had to be controlled. Laws had to be created. There was no mail service,

telegraphs, roads or bridges. To add to his problems 90 percent of the miners, half-maddened by the gold fever, were aliens and all were individualists. It was due to Ogilvie's skill and reputation that order evolved out of chaos. Another early geologist in the Klondike was Joseph Keele who, alone or together with other G.S.C. partners, explored the remaining river systems in the Yukon.

In the Northwest Territories, early G.S.C. explorer-geologists Robert Bell and J. Mackintosh Bell examined and mapped the Great Slave Lake areas in 1889. J.M. Bell, assisted by Charles Camsell, also undertook his epic exploration of Great Bear River, Great Bear Lake and the Coppermine River. During the mapping trip he observed rocks stained with cobalt bloom and copper green on the rocky east shores of McTavish Arm. This report caught the notice of Gilbert Labine many years later and, in investigating it, he found the radium-bearing pitchblende veins of Port Radium in 1930.

Charles Camsell in 1905 carried out a program of geological reconnaissance in the northern Yukon and later worked in the Northwest Territories. Then D.D. Cairnes worked in the Yukon. Much of our knowledge about mining between 1907 and 1917 in the Yukon is based on Cairnes' work.

During the great Klondike Gold Rush of 1898, many mining engineers visited the Klondike. One of them, an Englishman named Robert Anderson, obtained the Anderson Concession on Hunker Creek so that he could install hydraulic equipment to mine the gold where hand mining was not economical. Together with the Boyle Concession, it remained a thorn in the side of small placer operators until the mid-1960's when, with the closing of the last dredging operations, the concessions were given up.

Although many people made their contribution to placer mining, Grant Barrett, the last manager at the Yukon Consolidated Gold Corporation operation on Bear Creek, Yukon Territory, deserves special credit. He spent most of his professional life working for this company, the last of the dredging operations in the Klondike. When the gold rush fizzled out, placer mining by dredging and monitors continued in the Dawson area for many years. With the introduction of the bulldozer, a brand new mining technique evolved which is still the primary method used today.

Hard rock mining North of 60° began on copper showings found near Whitehorse by prospectors on their way to the Klondike. Following the decline

of the Klondike Gold Rush in the early 1900's, many small operators began underground mining operations on copper deposits in the Whitehorse Copper Belt.

In 1905, work began in a second area, the Conrad Mining District, on mineral claims in the Windy Arm area of Tagish Lake. This provided the impetus for substantial prospecting activity in the Watson and Wheaton rivers country. Colonel J.H. Conrad organized the most important of the mining ventures. Coal mining was carried out near Carmacks, as well as in several localities near Dawson, such as Coal Creek.

Between 1917 and the early 1960's, G.S.C. geologists W.E. Cockfield, E.D. Kindle and H.S. Bostock kept the public aware of mining developments in the Yukon through their reports. Bostock is fondly remembered by geologists and engineers because of his work which became the basis of modern day prospecting and mining in the Yukon.

Following the discovery of silver on Keno Hill in 1917, major contributions were made to mining developments by geologists Livingston Wernecke, William Smitheringale, R.E. "Dutch" Van Tassell and engineers Brodie Hicks, A.E. Pike and Don DeLaporte. Many other geologists and engineers contributed to the success of mining in the Keno Hill area.

In the 1960's and early 1970's new mines were brought into production in the Yukon and major new mineral deposits were found. Some of the geologists and engineers involved include Aaro Aho, John Brock, G. Skerl, J. Allen, D. Rotherham, Charles Brown, Gordon Davis, A. Archer, R. Cathro, M. Phillips, Ross Kenway, J. Christian, Colin MacDonald, and R. Thurmond.

From 1930 until the present time, hard rock mining in the N.W.T. developed along the same lines as in the Yukon. Numerous geologists and mining engineers made outstanding contributions to the growth of the mining industry in this territory.

Airplanes were used by pilot-mining engineers W. "Bill" Jewitt and G.H. "Mike" Finland in the early days of the rush to Great Bear Lake — started by the discovery of silver, radium and pitchblende-bearing veins at Echo Bay. They worked for Cominco and were very active during the period at Great Bear Lake and the subsequent rush at Yellowknife.

J.J. Byrne and sons, Jerry and Norm, arrived early in the N.W.T. and their activities eventually led

to the finding and bringing into production of the Discovery gold mine.

The G.S.C. continued to make important contributions by geological mapping and recording exploration and mining activity in the N.W.T. under A.W. Jolliffe, C.S. Lord, D.F. Kidd and C.H. Stockwell. Other geologists, such as A.S. Dadson and N. Campbell, made significant discoveries in the Yellowknife area while working for mining companies.

Mining engineer J.G. McNiven, known for his work in the early days in the Yellowknife gold camp, became a mayor of Yellowknife and a first resident member of the N.W.T. Council. W. "Bill" McDonald settled in Yellowknife where he practised as a consulting engineer. Neil Campbell played a prominent role in the appraisal of the mineral deposits which later became Pine Point Mines Ltd.

Len White, Lyle Dunn and Jack Crowhurst made important contributions in the finding, developing and bringing into production of the Canada Tungsten mine while Murray Watts, Norm Byrne, Jr., and J.D. Curry explored for many years in the N.W.T.

Chief mining engineer Steve Homulos spent 30 years with the Department of Indian and Northern Affairs and its predecessors, working in the mine safety field relative to the territories. Under his direction, mine rescue programs, new regulations and mine environmental units were developed.



Mining production

Production came from seven mines which together produced lead, zinc, copper, gold, silver and tungsten. The value of mineral sales for the N.W.T. was down 15 per cent from \$214,346,255 last year to \$181,787,000. Mineral production was down, with the exception of gold which showed an increase in production over last year. Lead and zinc accounted for 77.5 per cent of the value of production this year.

There were 1,583 people employed by the producing mines in 1975, an increase of 210 over last year.

Lead-zinc

Pine Point Mines Ltd.

Pine Point Mines Ltd., the only lead-zinc producer in the Territories, geared output to currently restricted market conditions, producing approximately 19 per cent less metal than last year.

Since production from new deposits on the property increased the average hauling distance from the deposits to the mill, additional equipment and larger crews were necessary resulting in an increase in the mine staff by 60 employees over last year's figures.

Pine Point Mines Ltd.

Type:	Open-pit and underground
Location:	South shore of Great Slave Lake, 50 miles east of Hay River, N.W.T.
Product:	zinc and lead
Rate:	10,870 tons per day
Total Tons Milled:	3,904,677
Reserve Grade:	2.2 per cent lead and 5.7 per cent zinc
Reserves:	35,600,000 tons
Employees:	647

Gold

Cominco Ltd. — Con — Rycon — Vol Mines

Construction of the new Robertson Shaft neared completion by year's end, reaching the 4,335-foot level. Completion of the 5,800-foot shaft is expected early next year.

Cominco Ltd. (Con - Rycon - Vol)

Type:	Underground
Location:	1.5 miles south of Yellowknife
Product:	Gold — silver
Rate:	404 tons per day
Total Tons Milled:	148,482
Reserve Grade:	0.50 ounces gold per ton
Reserves:	1,452,000 tons
Employees:	236

Giant Yellowknife Mines Ltd.

Production came from underground (Giant, Supercrest and Lolor mines) and from an open-pit near the south end of the property. The grade of ore being mined is slightly lower than last year.

Giant Yellowknife Mines Ltd.

Type:	Underground and open-pit
Location:	1.5 miles north of Yellowknife
Product:	Gold — silver
Rate:	975 tons per day (including ore from adjoining Supercrest and Lolor properties)
Total Tons Milled:	391,969
Reserve Grade:	0.32 ounces gold per ton
Reserves:	1,880,000 tons
Employees:	360

Silver-copper

Echo Bay Mines Ltd.

Production came from the upper levels of the Echo Bay mine while the old Eldorado mine shaft was dewatered. Drilling for silver ore was carried out in the top levels of the Eldorado mine.

Echo Bay Mines Ltd.

Type:	Underground
Location:	Great Bear Lake
Product:	Silver-copper
Rate:	97 tons per day
Total Tons Milled:	30,870
Reserve Grade:	Not known
Reserves:	Not known
Employees:	112

Terra Mining and Exploration Ltd.

The company has extended its decline haulageway to the 800-foot level to allow development of the Nos. 10 and 11 veins at depth. The most significant exploration development was the discovery of the No. 13 vein at the 500-foot level.

Terra Mining and Exploration Ltd.

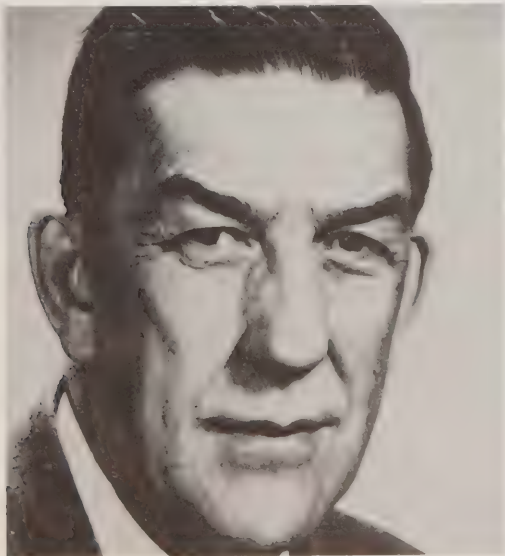
Type:	Underground
Location:	10 miles south of Great Bear Lake
Product:	Silver-bismuth-copper
Rate:	117 tons per day
Total Tons Milled:	42,433
Reserve Grade:	Not known
Reserves:	Not available
Employees:	57

Tungsten

Canada Tungsten Mining Corporation Ltd.
The E zone orebody has supplied all of the mill feed since mid-June but the presence of a talc-like material and high silica content in the ore caused milling problems which lowered the recovery rate. Towards the latter part of the year the recovery rate improved. No copper was recovered this year.

Canada Tungsten Mining Corporation Ltd.

Type:	Underground
Location:	125 miles north of Watson Lake, Yukon Territory
Product:	Tungsten-copper
Rate:	491 tons per day
Total Tons Milled:	179,023
Reserve Grade:	1.63 per cent tungsten trioxide and 0.23 per cent copper
Reserves:	4,257,000 tons
Employees:	158

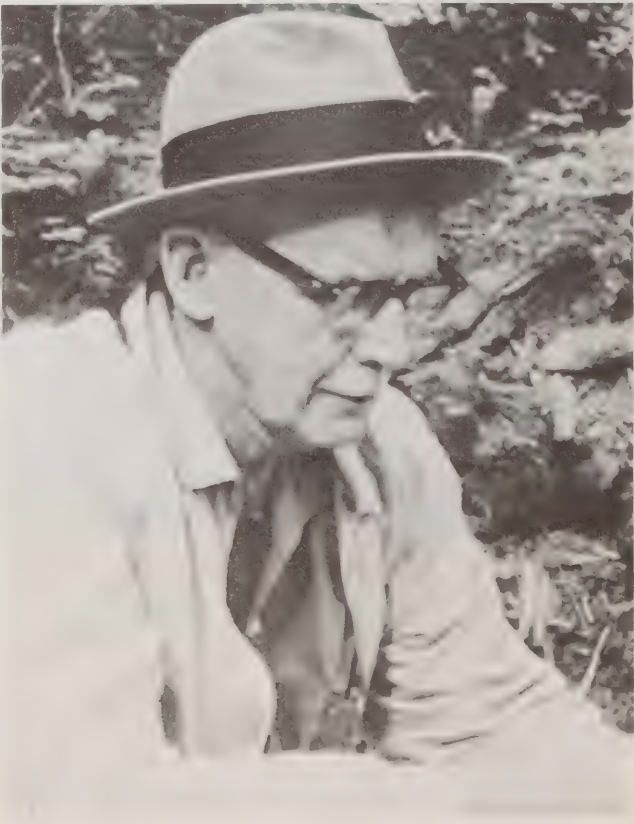


Silver

Hope Bay Mines Ltd.
Hope Bay produced approximately 11,000 ounces of silver in 1,176 pounds of concentrate. The mill processed up to 30 tons of ore per day with an average of 23 tons per day over a milling period of 33 days. Mining was carried out from June till early September. The ore came from the lens which supplied the ore last year but the grade was lower this year. The company continued to explore targets on its property in the hope of finding new ore.

Hope Bay Mines Ltd.

Type:	Underground
Location:	80 miles south of Cambridge Bay
Product:	Silver
Rate:	23 tons per day
Total Tons Milled:	712
Reserve Grade:	Not known
Reserves:	Not known
Employees:	13





Developing properties

Nanisivik Mines Ltd. (99) continued building the townsite, wharf and mine facilities. Exploration and mine development were carried out with an expected completion in the autumn of next year. The first shipment of concentrates from the mine, 18 per cent owned by the federal government, will be exported during the 1977 shipping season.

Cominco Ltd. and *Bankeno Mines Ltd.* postponed their decision to bring the deposit of Arvik Mines Ltd. (100) on Little Cornwallis Island into production. The company expects to make a decision next year.

Mineral exploration

Mineral exploration in the Northwest Territories has steadily increased. In 1975, 21,049 claims were staked, an increase of nearly 73 per cent, and exploration expenditures probably exceeded 25 million dollars, an increase of 39 per cent over the 18 million dollars spent last year.

Lead-zinc

Keewatin District

Noranda Exploration Company Ltd. (2) flew a geophysical survey in the Kaminak-Quartzite Lake area in early spring. Three holes were drilled, two on anomalies on the north shore of Kaminak Lake and one on an anomaly southwest of Heninga Lake. Geological and ground geophysical surveys covered anomalies detected by the airborne survey and the favourable ones were staked. Geochemical sampling along the shore of Henik Lake (1) and reconnaissance geology of the small greenstone belt south of Yathkyed Lake were also undertaken.

U.S. Steel Western Hemisphere Ltd. (2) contracted reconnaissance geological, geochemical and ground geophysical surveys of anomalies detected in 1964-70 by *Penarroya Ltee's* surveys in the Turquetil-Kaminak-Quartzite Lakes area. Promising areas were staked.

Hudson Bay Exploration and Development Company Ltd. did airborne magnetometer and EM surveys on prospecting permit areas south of Heninga Lake (4). Interesting anomalies were staked and tested by ground geophysics and prospecting. Two holes were drilled on anomalies northeast of Kaminak Lake at the end of the season.

Cominco Ltd. geologists mapped the SPI claims (3) south of Spi Lake and reconnoitered the greenstone belt in the Heninga-Kaminak Lakes area (4).

St. Joseph Explorations Ltd. drilled nine holes on the east, west and down-dip extensions of a massive silver-zinc-copper showing drilled last year by *Gemex Minerals Inc.* on Heninga Lake (4). Part of the area was tested by ground geophysics and geological surveys.

Aquitaine Company of Canada Ltd. drilled 14 holes on geophysical anomalies detected by its 1973 airborne survey in the Dawson Inlet area. Ground geophysical surveys tested anomalies detected last year in the Maguse Lake-McConnell River prospecting permits. One geologist spent a few days studying Aquitaine's holdings north of Baker Lake.

Cominco Ltd. did ground geophysics and prospecting in the Hayes River area (12).

Arctic Islands

Cominco Ltd. drilled a lead-zinc showing on Dundas Island (16), had one small geological crew on the Sheills Peninsula of northwest Devon Island, (16) and one on the Brodeur Peninsula of northwest Baffin Island (15).

Canadian Superior Exploration Ltd. (17) continued drilling, prospecting and mapping areas of lead-zinc potential in the Thumb Mountain Formation on Cornwallis Island.

Trigg, Woollett and Associates Ltd. conducted reconnaissance geochemical exploration on Northern Baffin Island (15).

Mackenzie District

A number of companies flew extensive EM and magnetic surveys over parts of the northern Slave Province (21-33) which led to extensive staking and some ground follow-up.

Cominco Ltd. explored throughout the northern Mackenzie Mining District, including at *Bathurst Norsemynes* (26) drilling on the Boot Lake, Jo and A zones where several good grade intersections were reported and large diameter core was obtained from the A zone for mill tests. On the RUN group near the Arctic coast (22) 3,000 feet were drilled, and geological mapping and geophysics covered a large claim block. A soil sampling follow-up of a lake sediment anomaly in the Indin Lake area (51) gave negative results.

Great Plains Development Company of Canada Ltd. did extensive helicopter-supported geological reconnaissance north of Muskox Lake and west of the Back River (28), a geological evaluation of a galena

vein on an island in Bathurst Inlet (20), and geological mapping on Permit 316 (24) south of High Lake.

Noranda Exploration Ltd., after airborne EM and magnetic surveys, staked a number of claim blocks on Archean volcanic belts in the Northern Slave Province, particularly in the High Lake area (23) where some work was done in a joint venture with *Great Plains Development Company*. Ground EM and magnetometer surveys, soil and rock geochemistry and geological mapping tested favourable ground. A geophysical target was drilled on the HAWK and BLUE claims east of Takijuk Lake (31) and ground geophysics and geological mapping followed AEM on claim groups in the Beechey Lake area (28).

Kennco Exploration (Canada) Ltd. did EM, magnetometer and geological surveys on five claim groups near its High Lake deposit (23) and drilled 2,000 feet on the HOLE and BLEW groups.

Brascan Resources Ltd. and *Conwest Exploration Co. Ltd.* (27) drilled some 2,000 feet on the YAVA deposit at Agricola Lake in the Hackett River-Beechey Lake volcanic belt, and approximately 2,000 feet on other targets. Airborne and ground geophysical, and detailed geological surveys involved five geologists.

Great Plains Development Company of Canada Ltd. conducted ground EM and magnetometer surveys in the Indian Mountain Lake area (35) locating conductors with associated magnetic highs.

Rayrock Mines Ltd. (42) drilled 924 feet in five holes on a lead-zinc prospect on Keith Island in the East Arm of Great Slave Lake.

Western Mines Ltd. (62) fence drilled on 1,300 claims acquired west of the Pine Point Mines Ltd. property.

Pine Point Mines Ltd. (62) drilled approximately the same exploration footage on its property as it did last year.

Pine Point Mines Ltd. (63) drilled for lead-zinc in the Paleozoic carbonates at Windy Point on Great Slave Lake.

Nahanni District

Giant Yellowknife Mines Ltd. (65) diamond drilled geochemical anomalies, outlined in 1973-74, on its prospecting permit area.

Cadillac Exploration Ltd. (66) extended the third level adit on the #3 zone of the Prairie Creek deposit. *Noranda Exploration Company Ltd.* did a preliminary evaluation of the deposit but have not optioned the property.

Cominco Ltd. (67) completed reconnaissance mapping and prospecting of its permit areas in the Mackenzie Mountains. Detailed geological mapping, prospecting and diamond drilling on the SB claims apparently gave encouraging results. Detailed geological mapping and minor trenching tested lead-zinc occurrences in the carbonates of the Sunblood Formation on the MA claims.

Canex Placer Ltd. and *U.S. Steel Western Hemisphere Ltd.* (95) geologically mapped and drilled 13 holes to outline the shale hosted lead-zinc deposit near Howard's Pass.

Welcome North Mines Ltd. (73) conducted regional exploration for carbonate hosted lead-zinc deposits, and detailed stratigraphic work on the Sekwi Formation. The company prospected several areas and staked the REV claims mid-way through the season to cover a high grade zinc showing which was drilled in September.

Harman Management Ltd. (74) explored part of the Sekwi Formation for lead-zinc deposits and several new occurrences were staked in the Palmer Lake region.

Serem Ltd. (74) did regional mapping and prospecting in the Sekwi Formation and detailed mapping, prospecting and diamond drilling on the TICK claims.

International Nickel Co. of Canada Ltd. (74) appraised the geology of the Godlin Lakes and Keele River regions.

Cordilleran Engineering Ltd. (75) conducted a regional geochemical survey in the Proterozoic sediments of the Redstone River area. Geological mapping, prospecting and diamond drilling tested the lead-zinc mineralization in solution-syneresis breccias on the Gayna River property.

Copper

Mackenzie District

Dupont of Canada Ltd. flew EM and magnetic surveys over extensive felsic and intermediate volcanics north of Muskox Lake and west of the Back River. The company staked many claims and did some ground follow-up (28). *Dupont* is in partnership with *Shell Canada Ltd.* on this project.

Long Lac Mineral Exploration Ltd. explored Permits 336 (31) and 337 (30) north and northeast of Contwoyto Lake with AEM and geological surveys on both permits and geological mapping, ground geophysics and soil geochemistry on anomalies.

Ecstall Mining Ltd. (Texasgulf Canada Ltd.) drilled near its copper-zinc deposit west of Takijuk Lake (32) and on its new discoveries near Itchen Lake (33) where seven million tons of mineralization has been drill indicated in one of three mineral zones. Geological, geochemical and geophysical surveying tested ground in these areas and elsewhere along the Takijuk-Point Lake volcanic belt.

Phelps Dodge Corporation of Canada Ltd. drilled conductors with coincident magnetic anomalies at Rochon Lake (36) west of Ennadai Lake but intersections are not as good as the 90 feet of approximately two per cent copper reported last year.

Cleaver Lake Mines Ltd. drilled 1,450 feet in nine holes on the PATCH group (59), a high-grade chalcocite showing near Hornby Bay on Great Bear Lake.

Nahanni District

Shell Canada Ltd. (68) prospected, mapped, and diamond drilled its permit area near the Keele River.

Geological Survey of Canada Open File Report #298 started a small staking rush by Serem, Shell, Noranda, Harman Management, Conwest, Cordilleran Engineering, Welcome North, etc. (68).

Cordilleran Engineering and *Rio Tinto* (68) staked over 500 claims just north of the area of open file report 298. The claim group reportedly contains several copper showings in the Redstone Formation. *Shell* (68) in October and November staked over 4,000 claims between Coates Lake and north of the Keele River valley to cover Proterozoic sediments with potential for stratabound copper deposits.

Copper-Nickel-Cobalt

Mackenzie District

Cominco Ltd. drilled a geophysical target of the LYN-PRN groups (19) near the mouth of the Perry River but significant nickel or copper mineralization was not intersected.

Monpre Iron Mines Ltd. (40) drilled a cobalt-nickel showing on the COGO claims at Lac Duhamel in the East Arm of Great Slave Lake.

The canoe was one method of travel used in the Precambrian Shield. Here a geological party returns to base camp at Ross Lake, N.W.T. in 1942. (GSC 93797)



W. Jewitt, pilot and mining engineer.

C. H. Stockwell. (GSC 202105)



Great Plains Development Company of Canada Ltd. (41) drilled five holes on a copper-cobalt showing in a volcanic vent in the Seton volcanics near Taltheilei Narrows in the East Arm of Great Slave Lake.

Uranium

Keewatin District

Pan Ocean Oils Ltd. and *Noranda Exploration Company Ltd.* staked part of a small Dubawnt Group remnant west of Yathkyed Lake (7).

Shell Canada Ltd. continued to study radiometric anomalies detected in the 1974 survey west of Tebesjuak Lake (8). Reconnaissance geology and geophysics surveyed an extensive area.

Cominco Ltd. optioned *Pan Ocean Ltd.*'s holdings (9) along the south and east shores of Baker Lake and undertook extensive geological mapping, geophysical surveying and diamond drilling. A uranium showing northeast of Kazan Falls was drilled and numerous radioactive anomalies detected by 1974 airborne survey were surveyed.

Rio Alto Explorations Ltd. (10) acquired a prospecting permit southeast of Princess Mary Lake and had a radiometric survey flown.

Urangesellschaft Canada Ltd. (11) acquired six prospecting permits and the area retained under *Metallgesellschaft Canada Ltd.*'s 1974 permits west and northwest of Baker Lake. Geochemical, airborne and ground geophysical surveys tested the areas and reconnaissance geochemistry and geophysics tested extensive areas west of Baker Lake. A block of 624 claims were staked for *Urangesellschaft* near Yathkyed Lake (7).

Uranerz Exploration and Mining Ltd. (11) surveyed areas west and north of Baker Lake with reconnaissance geophysics and geology.

Arctic Islands

Imperial Oil Ltd. (13) conducted airborne and follow-up ground radiometric surveys on southern Baffin Island between Frobisher Bay and Cape Dorset.

Mackenzie District

Cominco Ltd. (25) surveyed a large area southeasterly from Bathurst Inlet with helicopter-borne scintillometer and staked three claim groups on anomalies.

Mattagami Lakes Mines Ltd. did a lake sediment and airborne spectrometer survey from Scott Lake to

Ingalls Lake along a belt of paragneiss. The company staked at the west of Ingalls Lake (37) and did geological, geophysical and geochemical surveys.

Rio Tinto Canadian Exploration Ltd. did scintillometer and track-etch surveys on the holdings of Vestor Exploration in the East Arm of Great Slave Lake, at Charlton Bay, Meridian Lake (38) and Toopon Lake (39). Five holes totalling 2,466 feet were drilled on the Charlton Bay property (38).

W. Shupe ran a radiometric survey over the WS claims (44) near Tsu Lake, approximately 50 miles north of Fort Smith.

Noranda Exploration Ltd. did radiometric and geological surveys on the SUE-DIANNE group (52) near Mazenod Lake. Drilling of high-grade pitchblende veinlets in fracture zones was suspended because heavier equipment was unavailable.

Uranerz Exploration and Mining Ltd. did reconnaissance airborne radiometric and lake sediment surveys in the western part of the Bear Structural Province and checked anomalies at De Vries (54) and Betty Rae lakes (53) by geochemical, radiometric, magnetometer and geological surveys.

New Pyramid Gold Mines Ltd. drilled more than 2,100 feet in nine holes to test pods of uranium mineralization in a breccia zone between felspar porphyry and quartzite at Beaverlodge Lake near Hottah Lake. Geophysical and geochemical surveys covered part of the claims.

Cominco Ltd. drilled 2,500 feet in five holes on a uranium prospect on the CANINE-COMUR group (58) at St. Germaine Lake, mapped the COMUR group and two other showings. Drill assays were not as encouraging as surface indications.

B.P. Minerals Ltd. did geological and geochemical surveys on Permits 310, 311 and 312 (60) south of Dismal Lakes and on its claim groups adjoining Imperial Oil's Permit 316 to the north (61). In this area, Paleohelikian sediments overlie Aphebian granite which is in faulted contact with porphyritic felsite, probably also of Alpebian age.

Eldorado Nuclear Ltd. drilled 2,500 to 3,000 feet in eight holes to obtain geological information on the PEC group south of Dismal Lakes (61). A track-etch survey was also done.

Imperial Oil Ltd. drilled 1,500 feet in eight holes on the YUK group (61), adjoining the PEC group.

Gold and Silver

Keewatin District

O'Brien Gold Mines Ltd. (5) flew in heavy equipment and constructed a permanent camp at its Cullaton Lake gold deposit where an adit was collared and 204 feet were driven before the operation closed for the winter.

Mackenzie District

United Reef Petroleum Ltd. completed EM and magnetometer surveys on its PENNY claims (29), a gold property previously drilled by Cominco on the Back River.

Giant Yellowknife Mines Ltd. drove a 959-foot decline near the Salmita shaft at Mathews Lake (34) and began a feasibility study for a small-scale mining operation. Giant drilled the property of *Arcadia Explorations Ltd.* (21) near Grey's Bay on the Arctic Coast.

Mission Mining and Development Ltd. (43) drilled a silver prospect south of Hornby Channel on Great Slave Lake.

Terra Mining and Exploration Ltd. explored underground on the TA group at Bullmoose Lake (45) 50 miles east of Yellowknife, and a joint venture with *Sunshine Mining Ltd.* explored the LEAH claims and the Conjuror Bay area (56). Underground drilling continued at Terra Mine (56) with the development of the No. 13 vein.

Duke Mining Company Ltd. (46) drilled 830 feet on the Lambert vein on the TT gold property about 50 miles northeast of Yellowknife.

Precambrian Shield Resources Ltd. performed EM and magnetometer surveys on the AP claims at Myrt Lake (48) about 45 miles northeast of Yellowknife.

Arctex Engineering Services Ltd. surveyed part of the WAS claims at Banting Lake, about 10 miles north of Yellowknife (49) with VLF, EM and magnetometer.

Cominco Ltd. is drilling the *Kamcon Mines Ltd.* property adjacent to the Con mine (50).

Northrim Mines Ltd. (56) drove 400 feet of decline on its Silver Bay property in the Camsell River — Great Bear Lake area.

Echo Bay Mines Ltd. (57) explored the three claim Labine Point property of Dominion Explorers, dewatered the Eldorado Shaft to the 850-foot level, and explored the D-vein, south of the shaft.

Nahanni District

Nahanni Placers Ltd. (69) explored for placer gold in the Flat River area.

Other minerals

Arctic Islands

Diapros Canada Ltd. (18) continued to collect and process bulk samples of kimberlite on Somerset Island and to explore for additional occurrences.

Mackenzie District

Fidelity Developments Inc. (64) staked claims and acquired two permits south of Darnley Bay over a large and intense gravity anomaly.

Nahanni District

Canada Tungsten Mining Corporation Ltd. (70) drilled several geophysical anomalies outlined by survey in the Flat River valley south of Tungsten and diamond drilled the KEN claims of the *Tyee Lake Resources* (72).

Manalta Coal Ltd. (71) explored its Fort Norman area coal licence and encountered coal seams in several holes of an extensive rotary drilling program.

Luscar Ltd. conducted an extensive mapping program of the coal licences of Ponjo Petroleum Ltd. to the south of Fort Norman (71).



Mining giant Thayer Lindsley (centre) examines mining properties in the Whitehorse Copper Belt in the early 1960's with geologist C. Brown (left) and mining engineer J. Harquail (right).

Jerry Byrne and the first gold brick. Outpost Island, N.W.T., 1942.



Mining production

The value of mining production sales in the Yukon increased by 33 per cent from \$171,348,288 to \$228,659,000 during the year. Production came from five mines which together produced lead, zinc, copper, silver, cadmium, gold, asbestos and coal. Gold, copper and cadmium production were down but all others were up. Lead and zinc, which were up, accounted for 66 per cent of the total value of production.

There were 1,335 persons employed by the producing mines during the year, an increase of 79 over last year.

Lead-zinc-silver

Cyprus Anvil Mining Corporation

Cyprus Anvil produced lead, zinc and silver from its open-pit mine which is now approximately 500 feet deep. The Yukon's largest producer began a new drilling program to explore for mineralization at depth on its property in light of the Kerr Addison — A.E.X. Minerals discovery.

Cyprus Anvil Mining Corporation

Type:	Open-pit
Location:	130 miles north-east of Whitehorse
Product:	Zinc, lead, silver, gold
Rate:	8,983 tons per day
Tons Milled:	3,225,083
Reserves:	49,099,325 tons
Reserve Grade:	3.1 per cent lead, 5.5 per cent zinc, 1.1 ounces per ton silver
Employees:	462

Silver-lead-zinc-cadmium

United Keno Hill Mines Ltd.

United Keno Hill produced ore from six mines (Husky, No Cash, Townsite, Keno, Elsa and Dixie). Reserves were down although new reserves have been found in the Elsa mine.

United Keno Hill Mines Ltd.

Type:	Underground
Location:	31 miles northeast of Mayo
Product:	Silver, lead, zinc, cadmium
Rate:	363 tons per day
Tons Milled:	90,798
Reserves:	208,231 tons
Reserve Grade:	Not known
Employees:	329

Copper

Whitehorse Copper Mines Ltd.

Whitehorse Copper continued to mine ore from the Little Chief orebody using underground methods. Although the milling rate increased during the year, the grade was lower than last year. While ore reserve tonnage showed a decrease, grade was increased to 2.35 per cent copper.

Whitehorse Copper Mines Ltd.

Type:	Underground
Location:	Seven miles south of Whitehorse
Product:	Copper, silver, gold
Rate:	2,033 tons per day
Tons Milled:	737,982
Reserves:	3,054,897 tons
Reserve Grade:	2.35 per cent copper
Employees:	206

Asbestos

Cassiar Asbestos Corporation Ltd.

Cassiar Asbestos had its most productive year with fibre production estimated at 112,000 tons. This is a 24 per cent increase over last years production and a 10 per cent increase over the previous record year of 1972 when 101,888 tons of fibre were produced.

Cassiar Asbestos Corporation Ltd.

Type:	Open-pit
Location:	50 miles north-west of Dawson City
Product:	Asbestos fibre
Rate:	4,344 tons per day
Tons Milled:	1,385,648
Reserves:	4.6 million tons at 4.8 per cent fibre 1.1 million tons at 4.5 per cent fibre
Employees:	319

Coal

Tantalus Butte Coal Co.

Tantalus Butte increased its rate of production from 70 tons per day last year to 100 tons per day this year. This reflects the increased lead and zinc production of Cyprus Anvil, the parent company, which uses the coal to dry the concentrates.

Tantalus Butte Coal Co.

Type:	Underground and surface stripping
Location:	Carmacks
Product:	Coal
Rate:	100 tons per day
Tons Produced:	25,712 total. 16,123 underground 9,589 surface
Reserves:	Not known
Reserve Grade:	Thermal coal!
Employees:	19

Developing properties

An underground development — exploration program was carried out at the *Kerr Addison — A.E.X.* Grum property five miles north-east of Faro. The program consisted of driving a decline, cross cutting, raising and drifting in the ore in preparation for bulk sampling and diamond drilling. The underground work began in March and by year's end, 4,800 feet of lateral openings, 427 feet of raising, and 1,900 feet of diamond drilling was completed. In addition to the underground drilling, 63,000 feet of drilling was completed from surface. At the end of the year underground work was continuing. The limits of the deposit are as yet undefined but so far it is thought to contain more than 30 million tons with a grade of more than 10 per cent lead-zinc and nearly two ounces per ton silver.

Mineral exploration

The number of quartz claims staked during the year declined by 36.7 per cent to 8,569 although the claims in good standing rose to 35,699 and exploratory work on mineral claims continued at a high rate. Exploration expenditures probably exceeded \$16 million, an increase of 25 per cent over 1974 expenditures.

Lead-zinc-silver

Whitehorse District

In the Anvil Range (94) *Cyprus Anvil Mining Corp.* commenced a program of deep drilling and geophysical surveys in the vicinity of its FARO orebody, a gravity survey on the nearby LISA claims, and conducted a soil geochemical survey on its NOR claims. *Cyprus Anvil* also completed a program of geophysical surveys and diamond drilling on the DANA, HALO and IRMA claims.

United Keno Hill Mines Ltd. conducted geological mapping and a geochemical survey on the ABI claims (87).

The El Paso Mining and Milling Co. Ltd. did geological mapping, soil and rock geochemistry, and a VLF-EM survey on its SM claims (87).

Watson Lake District

Ogilvie Joint Venture carried out a geological examination and a soil geochemical survey of its BOB claims (86).

Tintina Silver Mines Ltd. completed a program of geological mapping, soil sampling, and magnetic and electromagnetic surveys on the EAGLE claims (88).

Empire Metals Corp. and *Texasgulf Inc.* carried out a geochemical survey on the PELLY claims (88).

Hudson Bay Exploration and Development Co. Ltd. conducted soil sampling, an IP survey, and did some diamond drilling on a skarn-type showing on its ANGIE claims (90). In the Mink Creek area, the company carried out EM and magnetic surveys and diamond drilling on the BEV claims (88). On the BINGY claims it conducted soil and silt geochemical surveys as well as magnetic and EM surveys (90).

In the Watson Lake area (91), *Noranda Exploration Co. Ltd.* completed an extensive program of geochemical and geophysical surveys as well as 8,400 feet of diamond drilling on its McMillan Property. To date, at least one million tons of massive lead-zinc sulphides in argillite have been outlined. Nearby, the *Hyland Joint Venture* carried out a detailed gravity survey and did some diamond drilling on the PORKER claims. *Granby Mining Corp.* have outlined three million tons of eight per cent combined lead-zinc by diamond drilling on the MEL, JEAN and WET claims.

In the Summit Lake (95) area of the Selwyn Mountains, *Canex Placer Ltd.* continued exploration on its Howard's Pass property with detailed geological mapping and trenching in addition to diamond drilling.

Welcome North Mines Ltd. carried out a detailed geochemical soil survey on the KATE claims (86) in the shales of the Road River Formation.

Mayo District

Exploration activity in the Mayo Mining District was concentrated in the Bonnet Plume River area (80), 120 miles northeast of Mayo. This was mostly follow-up work to the discoveries of 1973 and 1974 in the Corn Creek, Goz Creek, Harrison Creek and Dolores Creek areas, though some staking activity

continued. Most of the lead-zinc deposits occur in dolomites of Upper Hadrynian and Lower Cambrian age.

Archer, Cathro and Associates Ltd. (97) carried out diamond drilling on the FLUNK claims and geological mapping and geochemical sampling on the AL group. The company also staked several other claim groups in the general area.

Action Resources Ltd. (80) conducted diamond drilling and trenching on the PAL, GAL, ANN, GIN, ZOG and CVO claims in the Goz Creek area.

Amax Explorations Inc. had geological mapping and geochemical soil sampling done on the DTG claims in the Dolores Creek area and on the DOC claims in the Mount Profeit area (80).

Barrier Reef Resources Ltd. carried out further diamond drilling on its Goz Creek property (80) and staked on the nearby BH claims. Drilling to date has outlined approximately 12 million tons of eight per cent zinc.

Bow River Resources Ltd., Highhawk Mines Ltd. and Cominco Ltd. carried out an extensive program of geological mapping, geochemical sampling, geophysical surveys, trenching and diamond drilling on the PING property in the Corn Creek area. In addition, a soil geochemical survey was conducted over the PONG claims by *Bow River Resources* and *Highhawk Mines* (80).

Brinex Ltd. conducted geological mapping, geochemical soil survey and trenching on its Harrison Creek property optioned from *Cypress Resources Ltd.* (80).

Canorex Development Ltd. did geological mapping and geochemical sampling on the BAR claims (80).

Cominco Ltd. conducted an IP survey and carried out geological mapping on the BOB claims. In conjunction with *Yukon Revenue Mines Ltd.* diamond drilling and geophysical surveys were conducted on the FUN claims; with *Canwex Exploration Ltd.* detailed geological mapping, a geochemical soil survey, and IP survey and diamond drilling were done on the DF claims; with *Spectroair Explorations Ltd.*, diamond drilling was done on the DEA claims (80).

Cordilleran Engineering did work on the BID, RYE, BOB GEP, KIS, GYP, and RAY claims which included geological mapping, geochemical surveys and diamond drilling (80).

Cyprus Anvil Mining Corp. conducted a geochemical soil survey on the CLOE and ALE claims (97), geological mapping and geochemical surveys on the VUG and WILL claims (79), and diamond drilling on the DAGO, BUD and CON claims (79).

Great Plains Development Co. of Canada Ltd. carried out detailed geological mapping and some geochemical soil surveys on the BEV, LAURA, BUH, JEANETTE, KEN WINDY, YUK, BEN, and YOGI claims and staked the SLATS claims (97).

Harman Management Ltd. conducted detailed geological mapping on the GYR, ETC and ADD claims (80).

McIntyre Mines Ltd. completed a major program of geological mapping, geochemical sampling, and diamond drilling on the MOM, ODD, TOM, TARA and KIDD claims (80).

United Keno Hill Mines Ltd. did diamond drilling on its CASE claims in the Keno Hill area (79).

Ogilvie Joint Venture conducted geological mapping, geochemical surveys, and a gravity survey as well as some diamond drilling on the JASON claims in the MacMillan Pass area (83).

Dawson District

Hudson Bay Exploration and Development Co. Ltd. conducted geological mapping and geochemical soil sampling in the OG, KIM and DEM claims. The OG had additional work done in the form of an IP survey and diamond drilling. Mineralization is in a Proterozoic dolomite unit (78).

Cyprus Anvil Mining Corp. did geological mapping and soil geochemical surveys on the HOT, KIWI, OZ, UG and TART claims. In addition, diamond drilling was done on the OZ and TART claims (78).

Amoco Canada Petroleum Co. Ltd. mapped and performed geochemical surveys on the DOLL, LLOD, VIT and ML claims in the southern part of the Richardson Mountains. The mineralization consists of galena and sphalerite in limestone breccias (77).

Amax Exploration Inc. conducted geochemical surveys and geological mapping on its Doll Creek South and North properties, also in the southern part of the Richardson Mountains (77).

Union Minière Explorations and Mining Corp. Ltd. conducted geochemical surveys on the OD and KEPT claims (78).

Copper

Whitehorse District

On the Whitehorse Copper Belt, *Whitehorse Copper Mines Ltd.* (82) carried out surface exploration on several properties. Diamond drilling was conducted on the VALERIE, NORTH STAR and COWLEY PARK properties and IP and magnetic survey were run on the WE claims. *Whitehorse Copper* also did 1,400 feet of diamond drilling on the Kreft-Takacs property on Jackson Creek. Mineralization in the Copper Belt consists of bornite and chalcopyrite in skarns developed at the contact of limestone and granite intrusions of the Coast Range complex.

United Keno Hill Mines Ltd. conducted geological mapping and geochemical surveys on the GEE and HIG claims (87). Molybdenite was also found in a grey granodiorite on the HIG group.

Amoco Canada Petroleum Co. Ltd. conducted IP surveys on the PATT, CC, and DOYLE claims where copper and molybdenum sulphides were detected in altered felsic intrusives (84).

The *D.C. Syndicate* carried out a geological, geochemical and geophysical survey on the BAND claims which occur in a skarn environment; geological mapping and a soil survey were carried out on the BOND and LORI claims where there are copper-molybdenum showings in granodiorite (87).

Envoy Resources Ltd. did geological mapping and soil geochemistry on the END claims (93).

Cyprus Anvil Mining Corp. carried out IP, magnetic and soil geochemistry surveys on the AU and AG claims on Mt. Freegold (84).

Brascan Resources Ltd. investigated a copper showing in volcanics on the M claims at the base of the Kluane Mountains by geological mapping and trenching (85).

Western Mines Ltd. completed a diamond drilling program totalling over 5,000 feet on the CAR claims southeast of Prospector Mountain. Weak copper and molybdenum mineralization in a porphyry — type environment was encountered (84).

Mayo District

Cyprus Anvil Mining Corp. carried out a preliminary geochemical soil survey on the GREMLIN claims which contained a showing of vein and disseminated copper mineralization in clastic rocks (97).

Dawson District

Rio Tinto Canadian Exploration Ltd. conducted geo-

physical and geochemical surveys and did geological mapping and diamond drilling on the Lucky Joe property. Chalcopyrite and molybdenite occur disseminated in fractures in schists of the Yukon Group metasediments (81).

Kerr Addison Mines Ltd. carried out an IP survey and diamond drilling on the WON claims north of Fort Selkirk (84).

Gold

Whitehorse District

In the Moosehorn Range area (82) near the Alaska border *Claymore Resources Ltd.* discovered quartz veins containing visible gold on the LORI group of claims and conducted a program of geochemical and geophysical surveys, trenching and diamond drilling. A program of rotary drilling was also completed to ascertain the potential of placer deposits in the overburden. *Great Bear Mining Co. Ltd.* did trenching and diamond drilling on the nearby DEA claim group.

D.C. Syndicate discovered gold in a rhyolite dyke and did geological mapping and geochemical surveys on the GEM claims. On the PANTHER claims a program of geological mapping and geochemical soil sampling was carried out and on the RAINBOW claims a series of trenches were cut across a shear zone in granite (84).

Mt. Nansen Mines Ltd. re-opened the old Heustis Mine with a program of underground rehabilitation in order to re-evaluate the orebody (96).

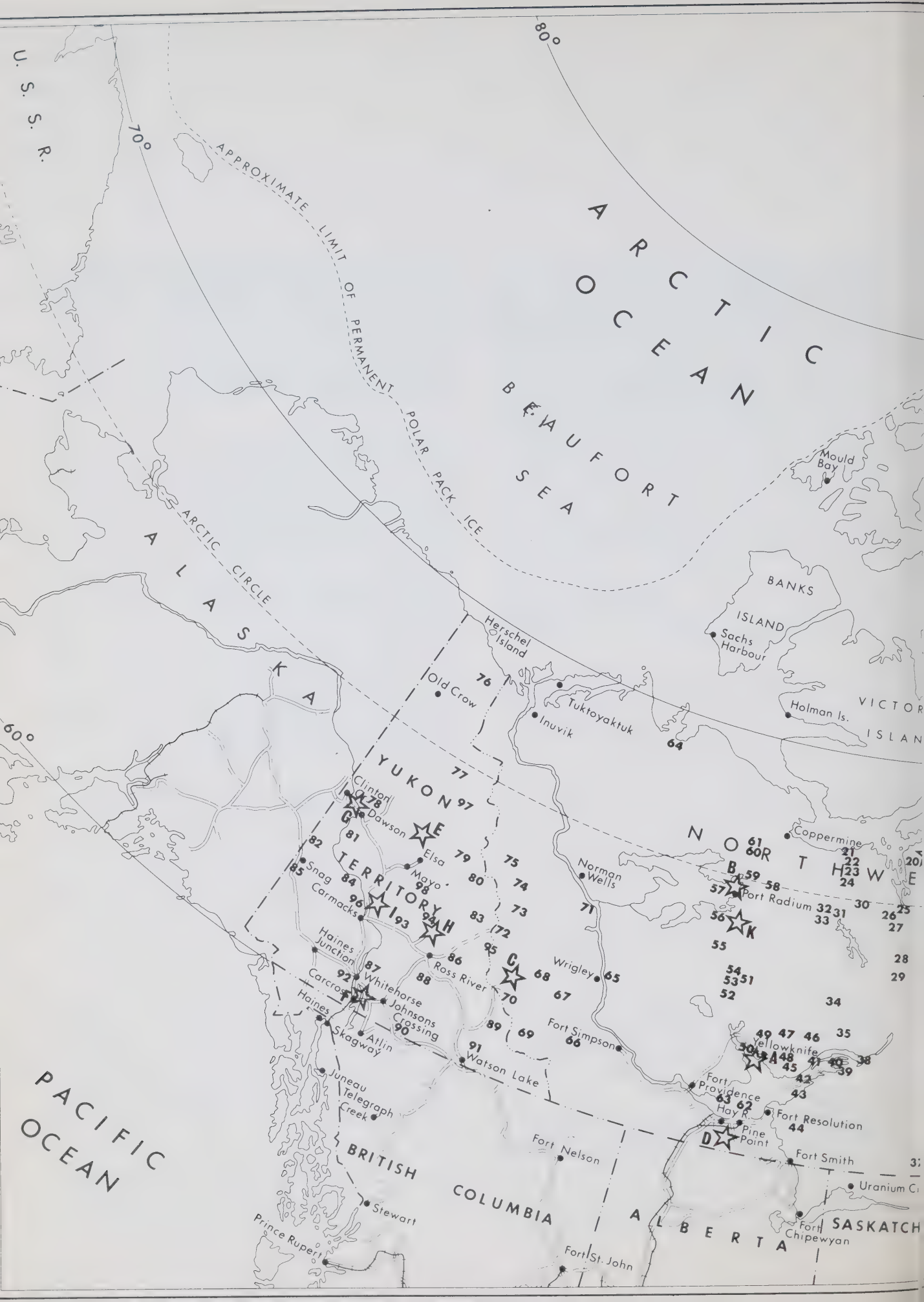
Rayrock Mines Ltd. drilled 7,800 feet of core on the LA FORMA property (96), where an extension to the original gold-silver vein structure was located. During this work, a new porphyry type occurrence was discovered on the eastern part of the property.

Tungsten

Watson Lake District

Union Carbide of Canada Ltd. conducted a program of detailed geological mapping, soil sampling, magnetic and electromagnetic surveys, trenching and drilling of two short diamond drill holes on the FELIX claims (93). The company also carried out a program of geological mapping, geophysical surveys and diamond drilling on a skarn deposit on the SUSAN claims (89).

Canada Tungsten Ltd. had a program of diamond drilling on a skarn deposit on the BAILEY claims (91).



MINERAL EXPLORATION AND MINING - YUKON & N.W.T.

SCALE OF MILES

0 100 200 300 400

LEGEND



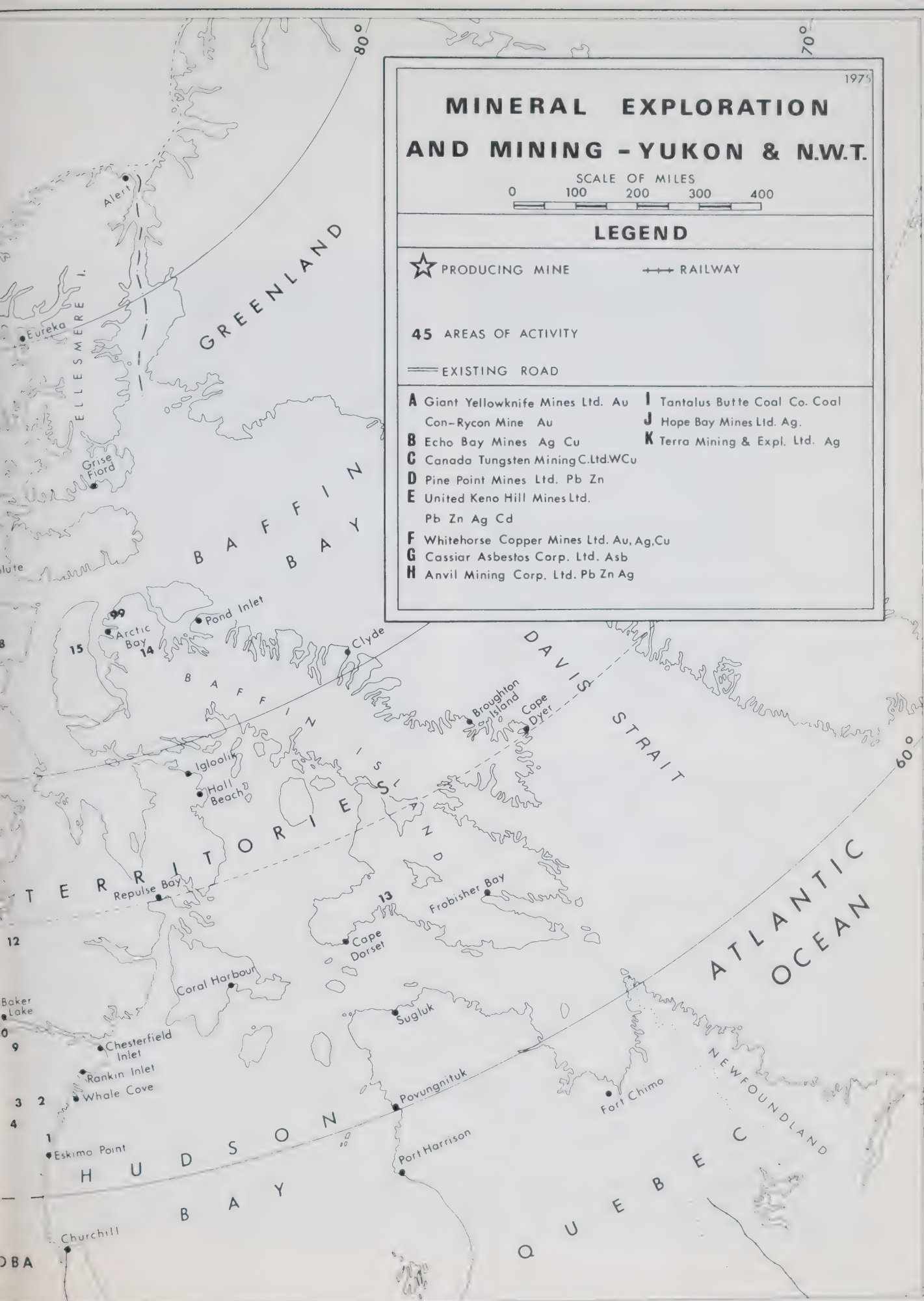
PRODUCING MINE

RAILWAY

45 AREAS OF ACTIVITY

EXISTING ROAD

- | | |
|---|---------------------------------------|
| A Giant Yellowknife Mines Ltd. Au | I Tantalus Butte Coal Co. Coal |
| Con-Rycon Mine Au | J Hope Bay Mines Ltd. Ag. |
| B Echo Bay Mines Ag Cu | K Terra Mining & Expl. Ltd. Ag |
| C Canada Tungsten Mining C. Ltd. WCu | |
| D Pine Point Mines Ltd. Pb Zn | |
| E United Keno Hill Mines Ltd.
Pb Zn Ag Cd | |
| F Whitehorse Copper Mines Ltd. Au, Ag, Cu | |
| G Cassiar Asbestos Corp. Ltd. Asb | |
| H Anvil Mining Corp. Ltd. Pb Zn Ag | |



Topographers and geologists at Pelly Crossing Roadhouse, Yukon Territory. Hugh Bostock is at the extreme right. (GSC 202083)

Sign post to everywhere. Top of Keno Hill, Yukon. (GSC 154779)

Mayo District

Union Carbide Mining Limited carried out an extensive program of geological mapping, geochemical and geophysical surveys and diamond drilling on the Mt. Armstrong property consisting of the TONGUE, CHEEK, TONSIL and NOSTRIL claims (98).

Barite

Watson Lake District

C. Smith carried out geological mapping, geophysical surveys and did some diamond drilling on the GARY and JASON claims (83) for bedded barite in Upper Devonian shales.

Mayo District

Baroid of Canada staked the CATHY and LORRAINE claims in the Hess Mountains. Work included geological mapping and beneficiation tests (83). *Welcome North Mines Ltd.* staked the TEA claims in the nearby area and conducted geological mapping and a soil geochemical survey (83).

Iron

Dawson District

Welcome North Mines Ltd. and *Bethlehem Copper Corp. Ltd.* conducted preliminary geological mapping and did some bedrock chip sampling on their DELTA and DAWN claims. Metallurgical tests were performed. The mineralization consists of fine-grained quartz-siderite iron formation. In addition, museum type specimens of the phosphate gem mineral, lazulite, also occur within the deposit (77).

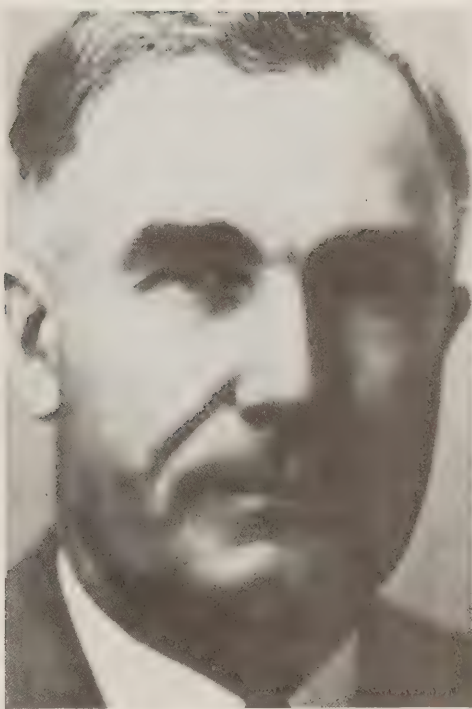


William Smitheringale, geologist.

Exploration geologist Aaro Aho was the key figure in the discovery of both the Anvil Mine deposit and the new AEX deposit in the Anvil-Vangorda district of the Yukon.

Livingston Wernecke directed the Keno Hill operations from 1921 to 1940.

"Dutch" Van Tassell, geologist.



Northern Natural Resources and Environment Branch

The Northern Affairs Program of the Department of Indian Affairs and Northern Development was reorganized in 1973 to provide the structure necessary to efficiently carry out the Department's responsibilities within the framework of the government's northern policy. As part of this program and in line with the federal government's objectives, the Northern Natural Resources and Environment Branch is responsible for establishing appropriate resource and economic development programs while protecting and conserving the northern environment.

Branch responsibilities include searching and identifying ways and means of expanding the northern economy as quickly and efficiently as possible, developing a broad plan of economic progress and recommending specific programs and policies for achieving these objectives.

Measures are being taken to ensure that the environment of the Canadian North is protected and to allow development to proceed at a reasonable rate. These measures are designed to balance environmental protection with developmental activities.

To meet objectives, the government has instituted a number of assistance programs to help the mineral industry overcome the high costs of operating in the North. These programs, which are the responsibility of the Northern Policy and Program Planning Branch, include the Northern Mineral Exploration Assistance Program, Prospectors' Assistance Program, Road and Airstrip Assistance Programs and Assay Services. In addition, financial support is given to organizations like Chambers of Mines, Prospectors Associations and Accident Prevention Associations which assist in northern mineral development.

In order to discharge its functions, the Northern Natural Resources and Environment Branch is subdivided into an Oil and Minerals Division and a Water, Lands, Forests and Environment Division.

This publication provides details of mining activity north of 60°. Since the management of mining lands in this region rests with the Oil and Minerals Division, its responsibilities, especially those of the mining section, are described in more detail on the following pages.

Oil and Minerals Division

The Oil and Minerals Division of the Northern Natural Resources and Environment Branch is responsible for the management and administration of

Crown mineral rights in the Yukon and Northwest Territories.

The division has the responsibility of formulating and recommending policies designed to encourage resource exploration and development, including the terms of disposal of mineral rights. It also plans and assesses programs designed to provide an adequate infrastructure so that the natural resources, when found, can be properly developed and delivered to the market.

Mining section

This section is responsible for the administration of mining and mineral rights (excluding oil and gas) from the time a claim is acquired to the production stage, including safety in mines. The section comprises three units — mining lands, exploration and geological services, and engineering and inspection services. The responsibility for these operations rests with the administrator of mining.

Department of Indian Affairs and Northern Development

Minister: Judd Buchanan, Ottawa, Ontario

Deputy Minister: A. Kroeger, Ottawa, Ontario

Assistant Deputy Minister:

A. D. Hunt, (succeeded by E. Cotterill in 1975)
Ottawa, Ontario

Northern Natural Resources and Environment Branch

Director: F. J. Joyce, Ottawa, Ontario

Regional Director (Y.T.):

B. J. Trevor, Whitehorse, Y.T.

Regional Director (N.W.T.):

B. Ritchie

Yellowknife, N.W.T.

Assistant Regional Director, Non Renewable Resources, Yukon:

R. R. McLeod, Whitehorse

Assistant Regional Director, Non Renewable Resources, Northwest:

R. W. Hornal, Yellowknife

Oil and Minerals Division

Assistant Director:

H. W. Woodward, Ottawa, Ontario

Mining section

Administrator of Mining:

J. M. Patterson, Ottawa, Ontario

Mining lands

Head: T. W. Dent, Ottawa, Ontario

Assistant Head:

(Yukon) B. C. Thompson, Ottawa, Ontario

(N.W.T.) P. M. Corrigan, Ottawa, Ontario

Supervising Mining Recorder:

B. R. Baxter, Whitehorse, Y.T.

Mining Recorders:

B. E. Sias, Whitehorse, Y.T.

O. C. Paton, Dawson, Y.T.

R. G. Ronaghan, Mayo, Y.T.

V. W. Johanson, Watson Lake, Y.T.

R. L. Williams, Yellowknife, N.W.T.

Engineering and inspection services

Chief Mining Engineer:

S. Homulos, Ottawa, Ontario

Yukon

Regional Mining Engineer:

N. G. Needham, Whitehorse, Y.T.

District Mining Engineer:

T. Csizmazia, Whitehorse, Y.T.

Electrical-Mechanical Engineer: Vacant

Mine Rescue Superintendent:

J. D. Barraclough, Whitehorse, Y.T.

Claims Inspector: G. W. Gilbert, Whitehorse, Y.T.

Environment Technician: W. Wong, Whitehorse, Y.T.

Northwest Territories

Regional Mining Engineer: M. L. Brown

District Mining Engineer:

E. Bengts, Yellowknife, N.W.T.

Environmental Control Engineer:

A. Patrick, Yellowknife, N.W.T.

Mine Rescue Superintendent:

N. Boss, Yellowknife, N.W.T.

Claims Inspector: D. Cormier, Yellowknife, N.W.T.

Exploration and geological services

Head: A. D. Oliver, Ottawa, Ontario

Evaluation Geologist: T. W. Caine, Ottawa, Ontario

Staff Geologist: A. V. F. Small, Ottawa, Ontario

Yukon

Regional Geologist: D. B. Craig

Project Geologist: W. D. Sinclair

District Geologist: J. A. Morin

Staff Geologist:

J. M. Maloney (succeeded by M. Marchand in 1975)

Northwest Territories

Regional Geologist: W. A. Padgham

Project Geologist: Vacant

Keewatin District Geologist: P. J. Laporte

Arctic Islands and Western Churchill Province

District Geologist: W. A. Gibbins

Mackenzie District Geologist: J. M. B. Seaton

Nahanni District Geologist: C. C. Lord

Mining lands

For administrative purposes, the territories have been divided into seven mining districts. A mining recording staff is responsible for the disposition of mineral rights within each district in accordance with the applicable legislation. For each territory, there is a supervising mining recorder whose principal function is to ensure that uniform practices are observed in the administration of the various mining acts and regulations.

The Nahanni District Recording Office is located at Yellowknife and the Watson Lake Mining Recording Office is continuing to serve as a sub-office for this district. The Arctic and Hudson Bay District Mining Recording Office was moved to Yellowknife on April 1, 1975.

The districts and location of Mining Recorders Offices are as follows:

	District	Office
<i>Yukon Territory</i>	Dawson	Dawson, Y.T.
	Mayo	Mayo, Y.T.
	Watson Lake	Watson Lake, Y.T.
	Whitehorse	Whitehorse, Y.T.
<i>Northwest Territories</i>	Mackenzie	Yellowknife, N.W.T.
	Nahanni	Yellowknife, N.W.T.
	Arctic and Hudson Bay	Yellowknife, N.W.T.

Mineral claims staked and recorded in the Yukon Territory and Northwest Territories during the year, with comparative figures for 1974, are tabulated below:

Yukon Territory

District	Claims Recorded	
	1974	1975
Whitehorse	4,849	3,462
Dawson	1,484	1,666
Mayo	6,038	1,609
Watson Lake	1,325	1,803
Total	13,696	8,540

Northwest Territories

District	Claims Recorded	
	1974	1975
Mackenzie	10,026	10,370
Arctic and Hudson Bay	1,218	5,315
Nahanni	936	5,364
Total	12,180	21,049

Engineering and inspection services

Headed by the chief mining engineer for the Yukon and Northwest Territories, who is stationed in Ottawa, this unit is responsible for the implementation of the mining safety ordinances and mining safety rules and regulations in mines as well as the blasting ordinance and regulations in the Yukon and the explosives use ordinance in the Northwest Territories. It is responsible for amendments and the preparation of new safety legislation when required, for maintenance of mine rescue stations and rescue equipment in both territories, and for the training of mine rescue teams.

A regional mining engineer is stationed at Whitehorse in the Yukon and at Yellowknife in the Northwest Territories. He is the senior mining engineer with a staff which includes a district engineer, electrical-mechanical engineer, environmental engineer, mine rescue superintendent, claim inspector and clerical staff who are responsible for:

1. Inspection of mines, quarries and blasting operations to ensure compliance with safety legislation.
2. Inspection of mineral claims to ensure compliance with the Yukon Quartz Mining Act, the Yukon Placer Mining Act and the Northwest Territories Canada Mining Regulations.
3. Ensuring that sufficient mine personnel are trained in mine rescue, recovery operations and first aid.
4. Conducting ventilation and dust surveys, monitoring radioactive contamination, and carrying out environmental studies of all underground and surface mining properties.

Mine rescue

Central mine rescue stations are maintained at Whitehorse, Yukon and Yellowknife, Northwest Territories. Substations are established at each mine. The department now owns 101 Drager GB-174 four-hour breathing apparatus. It is the policy of the department to have a minimum of 12 Drager units at each mine so that the mine rescue team can begin a rescue operation before the arrival of trained personnel from the central station.

Mine rescue teams from both territories compete in the Canadian Mine Rescue Championship each year. This year the competition was sponsored by Alberta and held at Calgary in June. Six teams competed from British Columbia, Alberta, Yukon, Northwest Territories and Nova Scotia. The Cominco team from the Con-Rycon Mine, Yellowknife, N.W.T. won the competition.

Mining safety statistics — Yukon and Northwest Territories

The U.S.A. standard method of recording and measuring work injury experience is used in the mining industry in the North. In accidents resulting in death, permanent total disability or permanent partial disability in the northern territories, the number of days recorded as lost-time conforms with the time charges set down in the American standard.

Disabling injuries are defined by the U.S.A. standard as being those which result in death, permanent total disability, permanent partial disability or temporary total disability.

Days recorded as lost-time do not include the day of the accident or the day of return to work.

Accident frequency is expressed as the number of accidents per one million man-hours worked.

Accident severity is expressed as the number of days lost due to accidents per million man-hours worked.

Accident statistics — 1975

During the year there were 70 disabling injuries reported in the Yukon Territory. The accident frequency for disabling injuries decreased from 25.07 last year to 24.97. There was an increase in the accident severity rate from 741 last year to 2902. As was the case last year, "fall of persons" was the chief cause of accident followed by "caught between two objects" and "miscellaneous causes". These three main causes accounted for 53 per cent of all reported accidents. One fatal accident occurred in the Yukon Territory. On July 15 a miner was fatally injured due to a fall of rock at the Whitehorse Copper Mine.

In the Northwest Territories, 76 disabling injuries were reported. The accident frequency rate decreased from 24.37 last year to 22.85 while the severity rate decreased from 6685 last year to 2460. "Fall of persons" was the main cause of accidents in the Northwest Territories accounting for 30 per cent of all accidents. This was followed by "strain while lifting", "caught between two objects" and "falling

objects". These four main causes accounted for 68 per cent of all accidents reported. One fatal accident occurred on September 16 in the Northwest Territories at the Echo Bay Mine when a mine worker was trapped in an ore bin and died of suffocation by fine ore.

Exploration and geological services

This unit provides a geological information and advisory service to the mineral industry in the northern territories. Regional geologists' offices are maintained at Whitehorse, Yukon and Yellowknife, Northwest Territories.

Two core libraries, the H.S. Bostock library at Whitehorse and the C.S. Lord library at Yellowknife, provide means for preserving valuable diamond-drill core data for the mineral industry. Each has laboratory facilities for core splitting, diamond-saw cutting, thin-section preparation and core storage.

In co-operation with the Geological Survey of Canada, the Yukon Chamber of Mines and the Northwest Territories Chamber of Mines, geo-science forums were held in the fall at Whitehorse and Yellowknife. Well attended by the mining and exploration communities, these meetings will be held on an annual basis.

Regional and district geologists carry out mineral property examinations, collect rocks and mineral specimens and advise the mineral industry, government departments and research scientists on geological problems arising from their work in the territories. The service includes carrying out geological evaluations on mining developments in the Yukon and Northwest Territories whenever government assistance is requested.

Department geologists assist prospectors and other geologists in identifying rock and mineral specimens by giving prospector training courses, in preparing geological compilation maps on mineralized areas and giving direction when requested.

The staff evaluates all geological, geophysical, geo-chemical and other related work submitted in respect of representation work performed on mineral claims and of work commitments on prospecting permits.

A library of released technical assessment reports is available and a microfilm system allows for material to be copied. A small library containing technical books and mining publications is available at Whitehorse and Yellowknife. Department of Energy, Mines and Resources' publications, such

as geological, geophysical and topographical maps, memoirs, papers and reports are offered for sale to the public at the offices.

Maps, papers, reports and open files released by the exploration and geological services unit are listed in Appendix 1 of this publication.

Mapping projects

Summer field surveys and other investigations are carried out under the direction of project geologists. Next year, the exploration and geological services will prepare geological compilation maps and undertake field checks in the following National Topographic System areas:

Yukon Territory	115-I-5 115-I-6 115-N-1 115-N-2
Northwest Territories	86-I-1 86-I-2 86-I-7 86-I-8

Special studies

The following special studies will be carried out using university research agreements:

- a) Stratigraphy and sedimentation of the Sekwi Formation in the Mackenzie Mountains, N.W.T.
- b) Study of magatic and metamorphic history of the Athapuscow Aulacogen, N.W.T.
- c) Study of microplankton zonation of the Western Queen Elizabeth Islands, N.W.T.
- d) Study of Clinton Creek Ultrabasic Pluton and associated asbestos deposit, Yukon.
- e) Fluid inclusion study of sulphide deposits of the Ogilvie and Mackenzie Mountains, Yukon and N.W.T.
- f) Study of igneous rocks and associated mineral deposits of the Whitehorse Copper Belt, Yukon.
- g) Metallogenic studies in the Proterozoic belt of copper mineralization, Ogilvie and Wernecke Mountains, Yukon and adjacent N.W.T.

The following studies will be initiated by the Regional Geologists' Offices:

- a) Study of gold-quartz deposits, Yellowknife Greenstone Belt, N.W.T.
- b) Mapping in Izok Lake Volcanic Belt, N.W.T.
- c) Mapping of copper occurrences in Proterozoic formations in the Nahanni Mining District, N.W.T.
- d) Study of barite bearing strata in the Mackenzie Mountains, Yukon.

Development and incentive programs

The development and incentive program section is responsible for the administration of policies and development programs designed to stimulate the exploration for non-renewable resources in the Yukon and Northwest Territories.

The government has developed a series of incentive programs designed to aid both companies and individuals in exploration and development activities in the North. These incentives can be broken down into three categories which include the provision of infrastructure, the provision of direct financial assistance, and the provision of technical assistance.

Provision of infrastructure

Northern roads program

The northern roads program, which was approved by the federal government in 1965, called for an annual expenditure of \$10 million for the following 10 years in both territories. It is the first phase of a long-range, 20-year program designed to bring permanent roads to within 200 miles of all potential areas of resource development. The policy was designed to be sufficiently flexible to allow revisions in priorities from year to year to keep pace with resource development. It also allowed for shift in volume of construction from one territory to another, depending on the requirements and based on northern territorial development.

By 1971, the northern roads policy was revised, modifying construction standards and providing for the pioneer resource roads, thus making available low-cost access into areas of undeveloped natural resource potential.

The new policy reflects the government's approach to northern development for the coming decade, as announced by the Minister in 1972. Essentially, this policy provides for a form of balanced development by which the needs of people are paramount and the environment protected.

In order to achieve the objectives of the northern roads policy, classification of roads was established wherein cost-sharing formulas between federal-territorial-private interests were defined. In this classification, there are two main categories of roads:

- a) communication and network roads and
- b) lateral roads

- a) communication and network roads are those highways and roads which provide a network of roads in the Yukon and N.W.T. and connecting links to the provinces. Their initial cost is borne completely by the federal government, which also bears 85 per cent of maintenance costs while the territorial government bears the remaining 15 per cent. Listed under this category are:

Trunk highways
Secondary trunk roads
Airport roads

Since 1965, when this multipurpose \$100 million, \$10 million-a-year program began, 1,752 miles of new roads at a cost of more than \$148 million have been constructed.

- b) Lateral roads are those roads which lead from a communication or network road to a location where resource exploration, development and exploitation will be carried out in the near future.

Lateral roads are further defined as two sub-categories — cost-sharing and non cost-sharing.



Mackenzie Highway

The Prime Minister announced the acceleration of the construction of the Mackenzie Highway in April, 1972. It is the first major northern construction project that is considering the environment and the immediate and long-term well-being of the local native people as carefully as the construction and engineering factors.

This highway, more than 1,000 miles long, will be an all-weather link from the Alberta-N.W.T. border to the Mackenzie Delta, connecting the communities (hitherto isolated from each other) down the Mackenzie Valley.

In late 1975 the Minister announced a slow down on the Mackenzie Highway construction. Current plans are to reach Wrigley Mile 440 by 1979.

Construction

The Mackenzie Highway is complete from Mile 0 (Alberta-N.W.T. Border) 296 miles to Fort Simpson.

Section A from Mile 297 (Fort Simpson) to 330 is essentially complete, but the next 16 miles, 330-346, has had little work done on it. Section B from Miles 346 to 394 is under construction by Tompkins Construction. The contractor is progressing well and it is expected the 1978 completion date will be met or bettered. Miles 395 to 411 was used as a training/operations section and has been constructed by Hire North. This section is now complete except for trimming and clean-up. Also there is rock to blast in the Willowlake Hill. Plans have been made to extend the training/operating section from 411 to 425. The section south from Inuvik, Miles 931-964 was completed in 1973 and turned over to the N.W.T. Government for maintenance.

Dempster Highway

The Dempster Highway continued to be identified as the major construction project during 1975. From Mile 0 of the highway, just south of Dawson, Y.T., the system stretches 377 miles to Arctic Red River. The route then proceeds northwest for 40 miles to its junction point with the Mackenzie Highway (Mile 931, Mackenzie Highway).

At the end of January 1976, 355 miles of the Dempster system had been completed, leaving approximately 83 miles for completion.

Tenders have been called for construction of the section between Miles 237-265 with a closing date

of March 9. The remaining section, Miles 265-290, will be tendered in 1977-78 with completion scheduled for 1978-79.

The scheduled completion date of the Dempster Highway is 1978-79.

Cost-Sharing roads

Cost-sharing roads, as the name implies, are those roads which are constructed by a resource developer and financed jointly by the developer and the government. Included in this sub-category are tote trails, initial access roads and permanent access roads.

During the year the tote trail program was expanded to allow for other transportation modes which, in some instances, may be less expensive or more appropriate, including low standard airstrips, small docks, helicopter landing pads and seaplane bases. This program, which has been renamed the Northern Exploration Facilities Program, will be administered by the governments of the Yukon and Northwest Territories. Assistance under this program may be up to 50 per cent of the cost of construction but shall not exceed \$30,000.00.

Initial access roads may receive the same maximum percentage assistance grant as tote trails, but the maximum federal contribution will not exceed \$100,000 for projects of an exploratory nature or \$500,000 for projects in the development stage. This classification provides for contribution towards more costly roads than those provided for under the Tote Trails Program.

Permanent access roads lead from the nearest permanent road to the location of resource development that has been brought into full production stage. These roads may receive a federal contribution of up to two-thirds of their cost. However, the maximum contribution may not exceed \$40,000 per mile.

Financial assistance for bridge and access-road construction to date amounts to \$2,350,545.00. The following companies have received assistance:

Arctic Gold and Silver Mines Ltd.
Western Minerals Limited
Anvil Mining Corporation Limited
Hudson Bay Mining and Smelting Co. Ltd.
Venus Mines Limited
Mount Nansen Mines Ltd.
New Imperial Mines Ltd.
(now Whitehorse Copper Minés Ltd.)
Canoe River Exploration Ltd.
J. Ray McDormott Canada Ltd.
Inexco Oil Co. Ltd.

Provision for direct financial assistance

Northern mineral exploration assistance program

This program is designed to encourage mineral exploration activity in the Yukon Territory and Northwest Territories. Assistance in respect of one or more exploration programs for a single applicant is limited in aggregate to \$100,000 but cannot exceed 40 per cent of the approved cost of an exploration program. A total of 136 corporate applicants have applied for assistance in one or more exploratory work programs. Since the inception of the program in 1967, 292 applications have been approved and a total of \$4,804,503.43 has been paid in grants, leaving an outstanding commitment of \$868,997.57. Moreover, payments of \$9,022,500 have been made towards a large portion of oil and

gas exploration in the Arctic Islands through Pan-arctic Oils Ltd.

Prospectors assistance program

In both the Yukon Territory and the Northwest Territories, \$70,000.00 is available in the form of grants to aid prospectors in their search for mineral deposits. A prospector may receive up to \$900.00 each year to help finance his prospecting venture. The program has been well received since its introduction in 1962 and has been instrumental in the location of several mineral discoveries.

During the year, \$24,150.00 was committed to 30 prospectors in the Northwest Territories and \$29,290.00 to 30 prospectors in the Yukon.

Provision of technical assistance

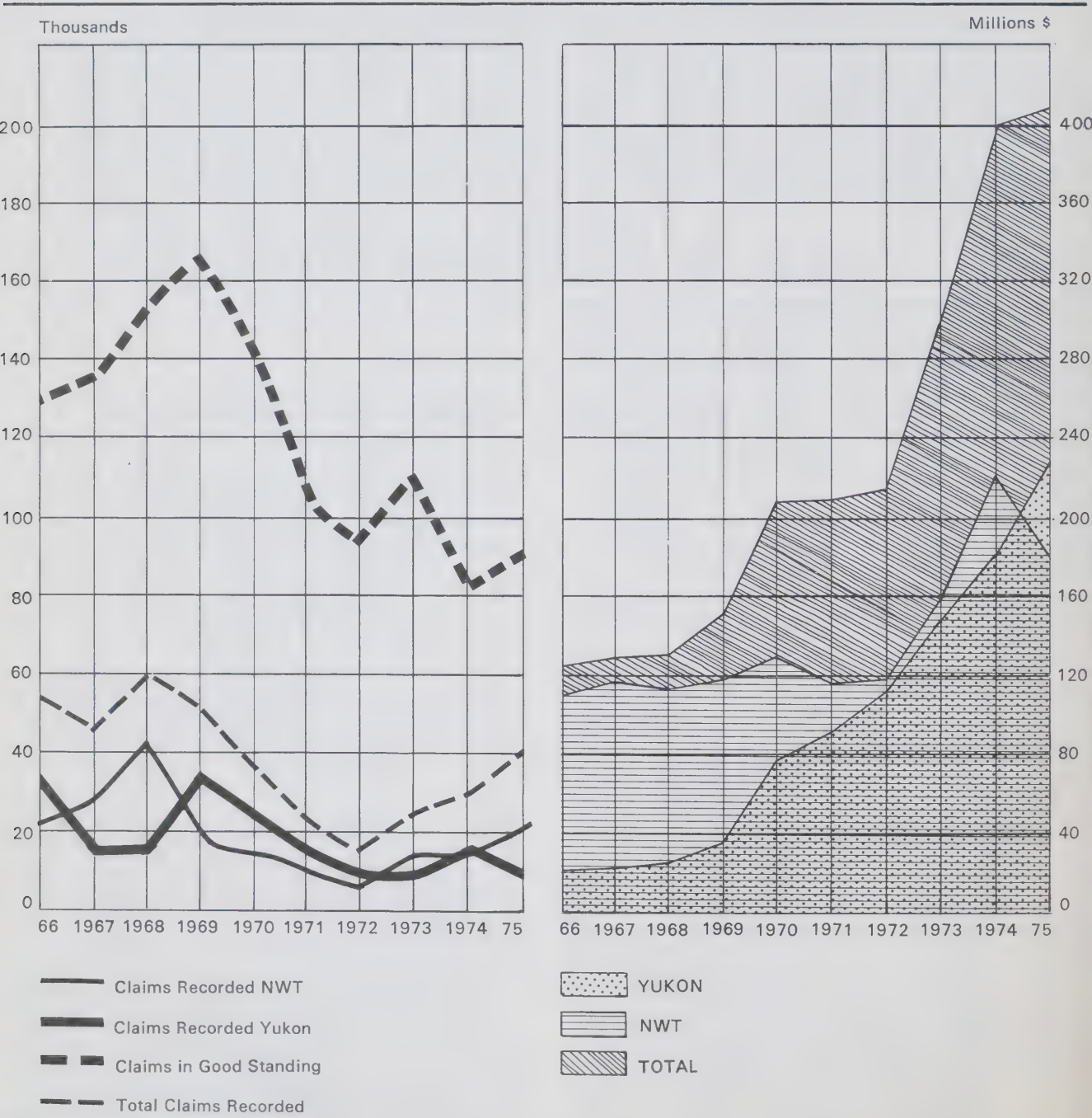
Assay service

There were approximately 5771 assays (representing a value of \$11,588.88) performed during the year at the Government Assay Office at Yellowknife.

In the Yukon, the federal government pays 50 per cent of the cost of 10 assays per year for each prospector submitting samples for analysis. In addition, the government pays full cost of assays submitted by prospectors working under the prospectors assistance regulations. During the year the total cost of this service was \$1,814.00 for 173 assays at half cost and 63 assays at full cost.



Mineral Claims Recorded Value of Production

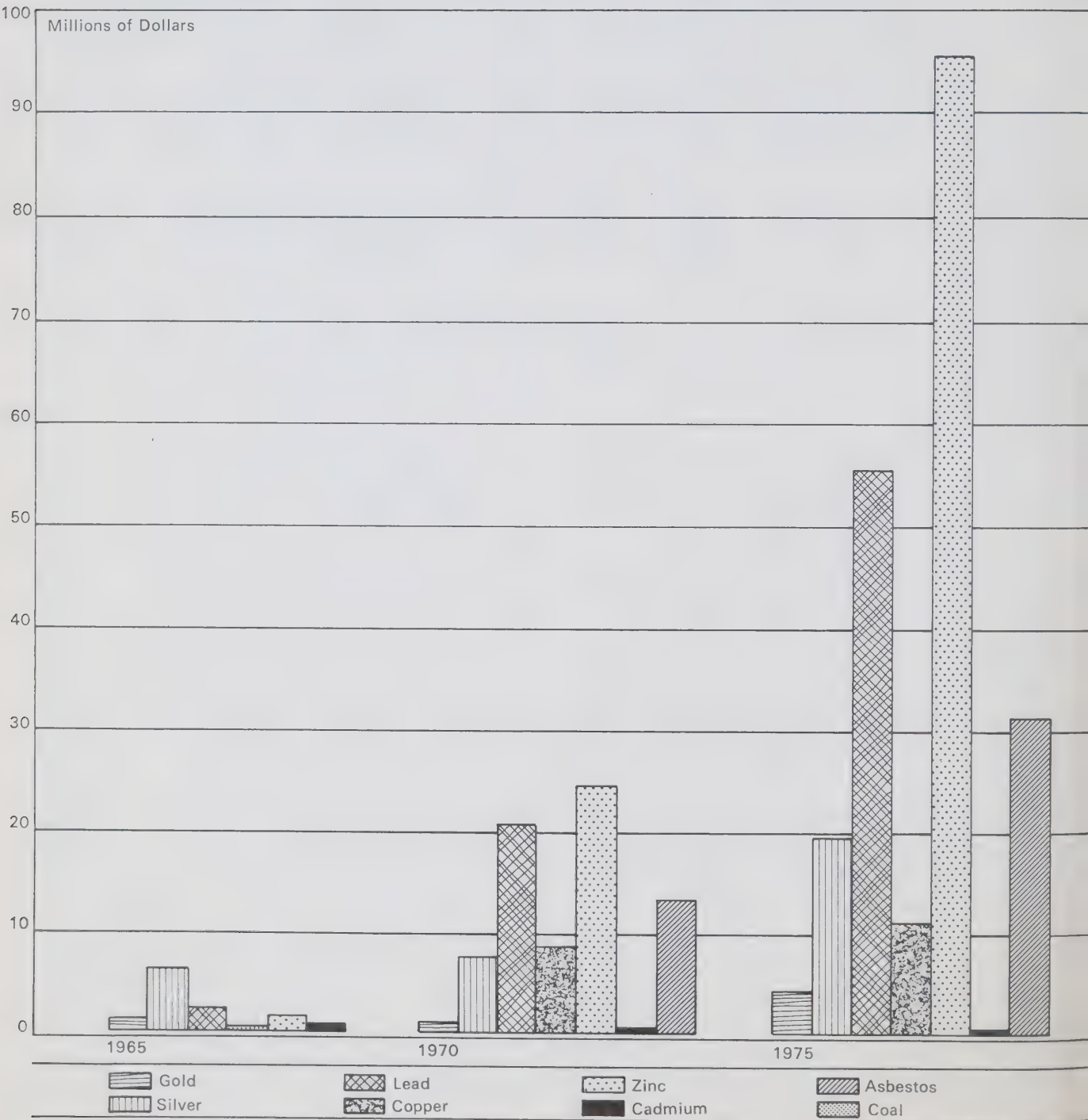


Mineral Production Chart
1966 to 1975

Northwest Territories												
Mineral		1966	1967	1968	1969	1970	1971	1972	1973	1974	1975(a)	Cumulative Totals(b)
Gold	\$	15,990,133	14,356,476	13,285,459	12,381,240	12,168,776	10,897,934	17,713,250	24,262,894	28,651,414	30,752,000	372,847,721
	ounces	424,029	380,304	352,306	328,502	332,844	308,339	307,479	249,075	184,467	186,000	
Silver	\$	2,325,407	3,429,755	8,677,365	3,910,888	5,114,587	4,574,616	6,778,965	13,691,789	17,669,851	9,821,000	69,605,449
	ounces	1,662,192	1,980,228	3,751,563	2,026,367	2,764,642	2,932,446	4,059,261	5,420,344	3,817,207	2,174,000	
Copper	\$	672,065	538,077	833,169	643,761	766,578	727,595	577,416	1,106,319	840,719	351,000	8,485,990
	pounds	1,496,805	1,131,126	1,732,160	1,251,723	1,320,502	1,378,021	1,133,767	1,734,178	1,084,505	551,000	
Nickel	pounds											12,850,205
Lead	\$	31,472,562	35,665,535	33,636,984	32,299,014	37,842,405	22,629,795	27,838,277	32,261,787	34,932,761	30,841,000	315,080,084
	pounds	210,659,720	254,753,820	250,275,180	212,913,740	239,206,099	167,628,110	180,439,960	199,887,160	168,708,403	151,555,000	
Zinc	\$	57,128,344	60,852,900	57,504,129	68,275,481	76,004,563	75,056,384	64,792,006	87,541,226	132,251,480	110,022,000	709,114,003
	pounds	378,333,400	419,964,800	407,830,700	448,296,000	477,115,900	448,633,500	339,741,000	362,549,600	378,944,069	293,392,000	
Uranium (d)	pounds											79,477,897
Cadmium	\$	2,769,372	2,551,920	774,060	675,136	737,632	301,476	205,436	61,152			8,750,819
	pounds	1,073,400	911,400	271,600	191,800	207,200	155,400	81,200	16,800			
Bismuth	\$					3,072	41,149					44,221
Tungsten	\$					490	7,578					
Total	\$	110,357,883	117,394,663	114,711,166	118,185,520	132,637,613	114,228,949	117,905,350	158,925,167	214,346,225	181,787,000	1,576,257,389
Yukon Territory												
Gold	\$	1,639,103	675,725	911,338	1,118,715	653,034	511,534	234,983	2,032,502	4,111,631	4,245,000	275,662,486
	ounces	43,466	17,900	24,167	29,682	17,862	14,473	4,079	20,865	26,472	26,000	
Silver	\$	5,868,217	6,701,756	4,806,384	5,182,166	7,845,312	8,966,417	8,331,575	15,342,856	26,800,905	29,434,000	205,523,995
	ounces	4,194,580	3,869,374	2,077,987	2,685,060	4,240,709	5,747,703	4,988,967	6,073,973	5,789,783	6,516,000	
Lead	\$	2,386,684	2,141,959	970,629	4,256,183	20,830,196	29,340,379	34,392,366	38,013,324	41,194,600	56,260,000	224,323,867
	pounds	15,975,125	15,299,709	7,221,940	28,056,581	131,670,010	217,336,142	222,921,742	235,522,452	198,950,056	276,466,000	
Copper	\$	3,409,779	3,409,779	5,097,157	7,645,623	9,148,995	2,709,696	890,286	14,791,665	15,571,426	11,580,000	62,366,410
	pounds	7,167,919	7,167,919	10,597,000	14,866,077	15,760,000	5,132,000	1,748,093	23,186,245	20,086,720	18,180,000	
Coal	tons	46,390	15,791		6,039	10,908	21,026	18,435	19,601	17,027	17,104	2,567,132
Zinc	\$	1,729,027	1,373,151	748,206	5,035,385	24,845,216	39,003,342	45,241,287	61,167,027	60,899,995	95,159,000	270,677,876
	pounds	11,450,510	9,476,545	5,306,429	33,062,280	155,964,948	233,134,144	237,225,560	253,321,575	174,498,553	253,757,000	
Cadmium	\$	306,336	265,997	147,716	239,965	261,528	114,654	82,759	45,718	17,331	11,000	6,361,566
	pounds	118,735	94,999	51,830	68,172	73,463	59,100	32,711	12,560	4,358	4,000	
Asbestos	\$	406,371	8,684,125	8,684,125	11,924,526	13,927,652	12,374,380	13,006,476	13,915,140	22,752,400	31,970,000	96,991,070
	tons	2,260		63,592	87,437	105,638	91,969	101,888	100,734	90,896	112,000	
Nickel	\$					3,996,762		3,996,762	5,209,621			9,206,383
	pounds					2,814,621		2,814,621	3,404,981			
Platinum	\$					325,573		325,573	149,458			475,031
	ounces					3,625		3,625	1,314			
Total	\$	11,975,757	14,990,529	21,365,555	35,402,563	77,511,933	93,020,402	106,502,067	150,667,311	171,348,288	228,659,000	1,154,155,816
(a) Preliminary Figures (b) Cumulative Totals - 1932 to December 31, 1975 (c) Cumulative Totals - 1886 to December 31, 1975 (d) Figures for years 1932, 1943 to 1953 not available (Figures for tungsten not available)												

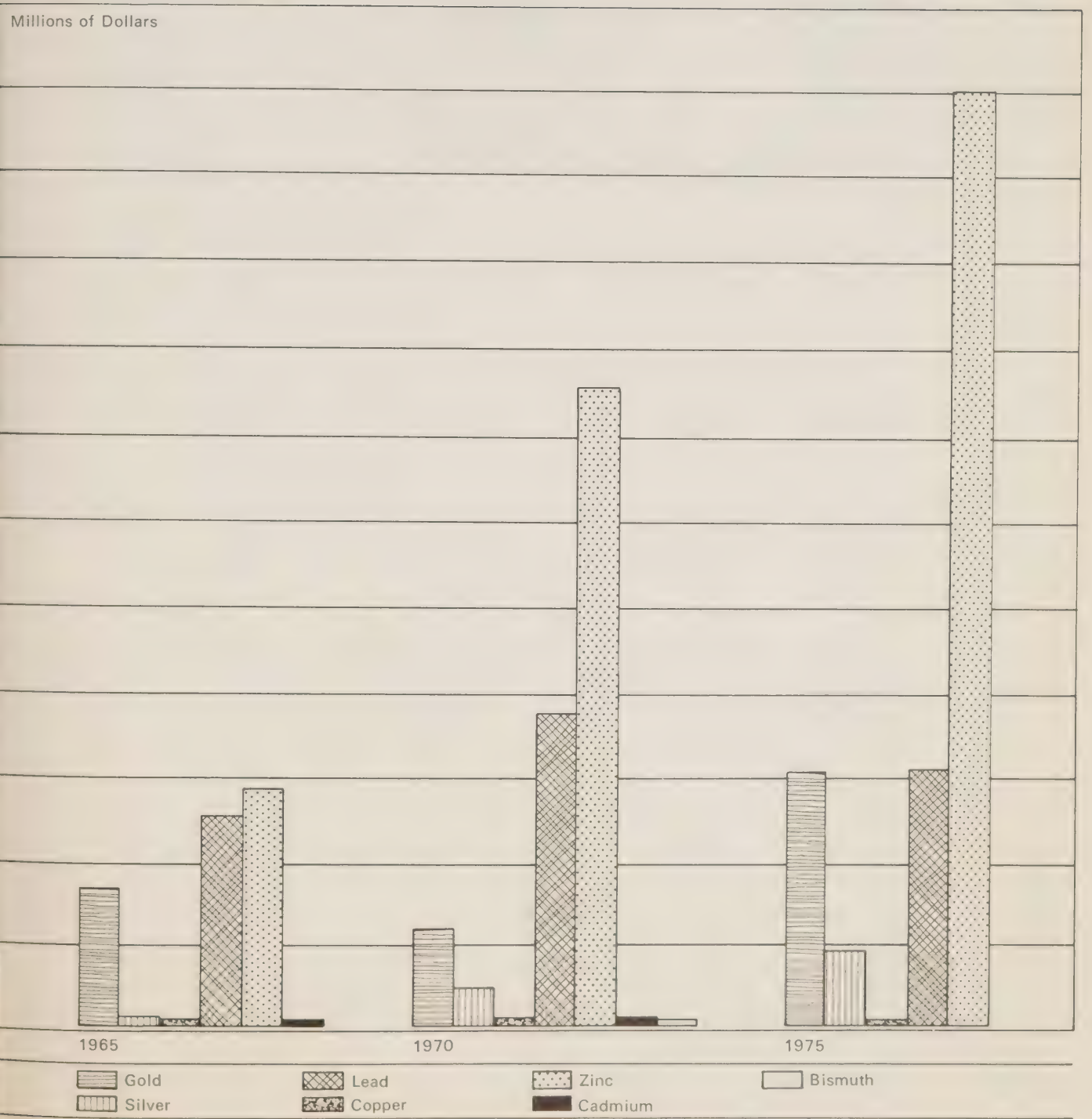
Value of Mineral Production

Yukon Territory



Value of Mineral Production

Northwest Territories



Mining Accident
Severities

Northwest Territories									
Mine	Number of Man/Hrs. Worked 1975	Number of Days lost Jan.-Dec. 1975	Accident Severity Jan.-Dec. 1975	Accident Severity Jan.-Dec. 1974	Thousands				
Canada Tungsten Mining Corp. Ltd.	368,849	321	870	1,079					
Con-Rycon-Vol	457,918	1,042	2,275	14,957					
Echo Bay Mines Ltd.	270,521	6,096	22,534	583					
Giant Yellowknife Mines Ltd.	729,521	438	600	18,004					
Pine Point Mines Ltd.	1,307,049	198	151	160					
Terra Mining and Exploration Ltd.	192,265	90	468	1,242					
Total	3,326,123	8,185	2,460	6,685					
Yukon									
Mine	Number of Man/Hrs. Worked 1975	Number of Days lost Jan.-Dec. 1975	Accident Severity Jan.-Dec. 1975	Accident Severity Jan.-Dec. 1974	Thousands				
Anvil Mining Corp.	1,010,014	426	422	886					
Cassiar Asbestos Corp.	701,585	213	304	705					
Whitehorse Copper Mines Ltd.	423,356	6,246	14,754	701					
United Keno Hill Mines Ltd.	640,064	1,215	1,898	592					
Tantalus Butte Coal Co.	28,088	36	1,281	1,083					
Total	2,803,107	8,136	2,902	741					

Mining Accident Frequencies

Northwest Territories

Mine	Number of Man/Hrs. Worked 1975	Number of Accidents Jan.-Dec. 1975	Accident Frequency Jan.-Dec. 1975	Accident Frequency Jan.-Dec. 1974
Canada Tungsten Mining Corp. Ltd.	368,849	10	27.11	44.06
Con-Rycon-Vol	457,918	13	28.39	23.14
Echo Bay Mines Ltd.	270,521	28	103.50	82.50
Giant Yellowknife Mines Ltd.	729,521	10	13.71	26.46
Pine Point Mines Ltd.	1,307,049	4	3.06	4.15
Terra Mining and Exploration Ltd.	192,265	11	57.21	77.25
Total	3,326,123	76	22.85	24.37

Yukon Territory

Mine	Number of Man/Hrs. Worked 1975	Number of Accidents Jan.-Dec. 1975	Accident Frequency Jan.-Dec. 1975	Accident Frequency Jan.-Dec. 1974
Anvil Mining Corp.	1,010,014	22	21.78	32.40
Cassiar Asbestos Corp.	701,585	6	8.55	15.70
Whitehorse Copper Mines Ltd.	423,356	11	25.98	14.11
United Keno Hill Mines Ltd.	640,064	30	46.87	30.93
Tantalus Butte Coal Co.	28,088	1	35.60	72.23
Total	2,803,107	70	24.97	25.07

Causes of Disabling Injuries in Mines

	Drilling	Caught between two objects	Strain while lifting	Fall of persons	Struck by moving object	Foreign matter in eyes	Tramming cars	Gassing	Fall of rock	Falling object	Blasting	Burns and Cuts	Miscellaneous	Total
Northwest Territories														
Canada Tungsten Mining Corp. Ltd.			1	3						3		1	2	10
Con-Rycon-Vol		3	1	3	2				2			1	1	13
Echo Bay Mines Ltd.		4	6	7	2	1			3	3		1	1	28
Giant Yellowknife Ltd.			2	5		1	1			1				10
Pine Point Mines Ltd.		1	1	2										4
Terra Mining and Exploration Ltd.			2	3	1	2			2	1				11
Total		8	13	23	5	4	1		7	8		3	4	76

Yukon Territory														
Anvil Mining Corp.		1	2	6	5	1				1		2	4	22
Cassiar Asbestos Corp.		1	1	1									3	6
Whitehorse Copper Mines Ltd.		1		1	1				4				4	11
United Keno Hill Mines Ltd.		6	4	7	3	1			2	4		2	1	30
Tantalus Butte Coal Co.		1												1
Total		10	7	15	9	2			6	5		4	12	70

Appendix 1

List of publications

Exploration and geological services D.I.N.A.

Books

Mineral Industry Report, 1969-70, Vol. 1, Yukon Territory and Southwestern Sector, District of Mackenzie; by D. B. Craig and P. J. Laporte, EGS 1972-1. \$2.00.

Mineral Industry Report, 1969-70, Vol. 2, Northwest Territories east of 104° west longitude; by P. J. Laporte, EGS 1974-1. \$2.00.

Mineral Industry Report, 1971-72, Vol. 1, Yukon Territory; by D. B. Craig and M. W. Milner, EGS 1975-6. \$3.00.

Mineral Industry Report, 1971-72, Vol. 2, Northwest Territories east of 104° west longitude; by P. J. Laporte, EGS 1974-2. \$2.50.

Mineral Industry Report, 1971-72, Vol. 3, Northwest Territories west of 104° west longitude; by W. A. Padgham, M. W. Kennedy, C. W. Jefferson, D. R. Hughes and J. D. Murphy, EGS 1975-8. \$3.00.

Mineral Industry Report, 1973, Yukon Territory; by W. D. Sinclair and G. W. Gilbert, EGS 1975-7. \$3.00.

Mineral Industry Report, 1974, Yukon Territory; by W. D. Sinclair, J. M. Maloney and D. B. Craig, EGS 1975-9. \$3.50.

Lake-Sediment geochemical sampling survey in the following areas: Yellowknife, Indin Lake and portion of the Cameron River and Beaulieu River Greenstone Belts; by D. Nickerson, G.S.C. Open File 129, 1972. \$12.00.

Maps

Preliminary geology map of Camsell River Silver District, scale five inches to one mile; by R. J. Shegelski and J. D. Murphy, G.S.C. Open File 135, 1973. \$3.50.

Preliminary geology map of Rainy Lake, N.W.T., 86E/9, scale 1:31,680; by J. D. Murphy, G.S.C. Open File 135, 1973. \$1.00.

Preliminary geology map of Rankin Inlet, 55K/16, scale 1:31,680; by P. J. Laporte and S. K. Frape, G.S.C. Open File 179, 1973. \$1.00.

Preliminary geology map of White Eagle Falls, N.W.T., 86F/12, scale 1:31,680; by W. A. Padgham, G.S.C. Open File 199, 1974. \$1.00.

Preliminary geology map of High Lake, N.W.T., 76M/7, scale 1:31,680; by W. A. Padgham, G.S.C. Open File 208, 1974. \$1.00.

Geology of Two Base-Metal Deposits (High Lake and Indian Mountain deposits) in the Slave Structural Province; by W. Johnson, 1974. \$4.00.

Preliminary geology maps of Hackett River area, N.W.T., scale 1:31,680; by W. A. Padgham, C. W. Jefferson, E. A. Ronayne, V. Z. Sterenberg and D. Bryan. \$2.00 per map.

EGS 1975-1; 76-G-13
EGS 1975-2; 76-G-12
EGS 1975-3; 76-G-5
EGS 1975-4; 76-F-9 succeeded by EGS 1976-6
EGS 1975-5; 76-F-16 succeeded by EGS 1976-8

Preliminary geology maps of various areas of the N.W.T. scale 1:31,680. \$2.00 per map.

EGS 1976-1; 65-H-16
EGS 1976-2; 65-I-15
EGS 1976-3; Parts of 56-D-2 and 7 (MK Project)
EGS 1976-4; 76-K-2
EGS 1976-5; 76-K-1
EGS 1976-6; 76-F-9
EGS 1976-7; 76-F-15
EGS 1976-8; 76-F-16

Papers

Copies of the following papers are available at the Regional Geologists' Offices or in Ottawa.

A Critical Review of Northern Mineral Potential; by D. B. Craig and J. A. Kelly. Paper presented at the Prospectors' and Developers' Association Convention, Toronto, Ontario, 1970.

Mineral Exploration North of 60°, Trends and Achievements; by R. W. Hornal and D. B. Craig. Paper presented at the Prospectors' and Developers' Association Convention, Toronto, Ontario, 1971.

Northern Canada Mineral Exploration 1972; by P. J. Laporte, W. A. Padgham and D. B. Craig. Paper presented at the Prospectors' and Developers' Association Convention, Toronto, Ontario, 1973.

Abstracts of the N.W.T. Chamber of Mines Exploration Symposium; by Exploration and Geological Services, Yellowknife, N.W.T., February, 1972.

A Review of Mineral Exploration in the Keewatin District, Northwest Territories; by P. J. Laporte, 1972. Presented at the Northwest Territories Chamber of Mines Exploration Symposium, Yellowknife, N.W.T., February, 1972.

Highlights of Mining Exploration in Northern Canada for 1973; by R. W. Hornal and D. B. Craig. Paper presented at the Prospectors' and Developers' Association Convention, Toronto, Ontario, 1974.

Exploration for Lead-Zinc in the Selwyn and Mackenzie Mountains, Yukon and Northwest Territories; by J. D. Murphy and W. D. Sinclair. Paper presented at the Prospectors' and Developers' Association Convention, Toronto, Ontario, 1974.

Mineral Potential of the Northwest Territories; by W. A. Padgham. Published in the *Geology of Canadian Arctic*; Editors: J. D. Aitken, D. J. Glass. Special publication of the C.S.P.G. and G.A.C., 1974.

Potential for Large Tonnage Mineral Deposits in a Selected Area (65° to 74°N, 80° to 120°W) of the Northwest Territories; by J. M. Seaton. Paper presented to CIM western meeting, Winnipeg, Manitoba, 1974.

Lead-Zinc Mineralization in the Central Dolomite Belt of the Lower Cambrian Sekwi Formation; by W. J. Crawford. Paper presented at Geoscience Forum, Yellowknife, N.W.T., 1974.

Lake Sediment Geochemistry as a Guide to Detection of Massive Sulphide Deposits in the Southern Slave Province; by R. G. Jackson and I. Nichol. Paper presented at Geoscience Forum, Yellowknife, N.W.T., 1974.

Summary of Exploration Activity, Mackenzie Mountains, 1975; by C. C. Lord. Paper presented at the Geoscience Forum, Yellowknife, N.W.T., 1975.

Mineral Exploration in Southern Yukon, 1975; by W. D. Sinclair. Paper presented at the Geoscience Forum, Whitehorse, Yukon, 1975.

Activity Reports

Mines and Mineral Statistics, North of 60 (published monthly and includes claim staking and production statistics for Yukon and N.W.T.).

Mines and Minerals Activities, North of 60 (published yearly and includes summaries of exploration and mining activities for Yukon and N.W.T.).

Indexes

(produced by Canadian Centre for Geoscience Data for D.I.A.N.D.) *Index of Mineral Claim Assessment Work Reports* by National Topographic System on file in Ottawa, Yellowknife and Whitehorse.

Index of Assessment Work by Concept on file in Ottawa, Yellowknife and Whitehorse.

Index of Geological Reports and Maps by National Topographic System of the Yukon and Northwest Territories. Includes work on file by: Mining and Oil & Gas, D.I.A.N.D.; E.M.R.; and other agencies.

Preliminary Studies

The following preliminary reports are on open file at Ottawa and at the Regional Geologists' Offices in Yellowknife, N.W.T. and Whitehorse, Y. T.

- 1) Preliminary Study on Metal Dispersion Patterns in Lake Sediments and the relationship to mineralization in the Yellowknife and Indin Lake areas; by R. G. Jackson, Exploration Geochemistry Group, Department of Geological Sciences, Queen's University, 1973.
- 2) Study of Coal in the Yukon; by D. B. Craig and M. J. Milner, 1973.
- 3) Coal Deposits in the Arctic Archipelago, N.W.T.; by T. W. Caine, 1973.
- 4) Soapstone Deposits of the N.W.T.; by J. D. Murphy, 1973.
- 5) Mineral Occurrence Overlays for geological maps in the western District of Mackenzie, NTS 75, 76, 85, 86, parts of 77, 87, 95, 96 and 105.

Papers in Preparation

- 1) Mineral Industry Report, 1969-70, Vol. 3, Northwest Territories west of 104° west longitude.
- 2) Mineral Industry Report, 1973, Northwest Territories.
- 3) Mineral Industry Report, 1974, Northwest Territories.
- 4) Mineral Industry Report, 1975, Northwest Territories.
- 5) Mineral Industry Report, 1975, Yukon Territory.

Preliminary copies of the following can be examined at the Regional Geologist's office, Yellowknife.

- 6) Geology compilation of Beniah Lake, 85-P-8.

Baffin Island South. GSC party enroute to the mainland.
(GSC 125159)





Indian and
Northern Affairs

Affaires indiennes
et du Nord

North of 60

Mines and Minerals Activities 1976

1
61
M35



The Place Where One Finds Things
That is how Nanisivik translates from Inuktitut, the Inuit language.
Canada's most northerly mine by Strathcona Sound on Baffin
Island is described in an article in this issue. The village of
Nanisivik shown here was designed to meet the individual and
community needs of workers isolated and in an extreme climate.



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Introduction

Mineral Exploration Highlights

Northwest Territories

Expenditures on mineral exploration in the Northwest Territories continued at a high level in 1976, probably exceeding the \$25 million estimated to have been spent in 1975. Only in the Arctic Islands was there a decline. Significant new discoveries and new emphases emerged in other areas to keep expenditures equal to, or raise them above, 1975 levels. Mineral production probably exceeded \$210 million, over \$190 million of it from metals.

There were significant increases in uranium exploration throughout the Territories with major expenditures in the Keewatin and in the immediately adjacent southwest Mackenzie District. Discoveries on Pan Ocean ground near Baker Lake have added impetus to this activity.

Uranium possibilities in the Aphebian sediments of the Kilohigok Basin in the Bathurst Inlet area have become an important target. Uranium is reported in highly-fractured rocks in a large graben subsidiary to the Bathurst Trench.

Base metal-silver targets in volcanic rocks in the Slave Province continued to excite interest, and Texasgulf added to the reserves of the Izok Lake deposit. The focus of greenstone belt exploration has shifted westward in the last year, but further discoveries can be expected on the eastern side of the Province.

In the mountains, widespread investigation of the copper potential of carbonate members within predominantly clastic late Proterozoic units replaced lead-zinc exploration as the major activity, but the latter continued at a high level and some new lead-zinc discoveries may be announced in the near future.

Discoveries by Western Mines west of Pine Point give promise for the new mining ventures in the Territories' most important producing area.

Nanisivik, one of the world's most northerly mines, and the most northerly metal mine, began production of lead and zinc concentrates on Baffin Island.

Canex Placer has announced its intention to construct an access road north from the Cantung road to Howard's Pass to facilitate the movement of equipment to the site where the company will test the deposit via underground workings in 1977 to 1979.

Yukon Territory

In 1976, some \$16 million was spent on mineral exploration in the Yukon. This is a decrease of roughly \$2½ million from the \$18½ million estimated to have been spent in 1975. This decrease is due, at least in part, to an increase in activity in British Columbia. While this trend may be expected to continue in the near future, largely because of significantly cheaper operating costs in B.C., there have been recent developments in the Yukon which are expected to keep exploration activity at a fairly high level, at least for the next few years.

The Huestis Mine belonging to Mount Nansen resumed production for 10 months in 1976 after being closed since April, 1969.

Rio Alto Exploration Ltd. discovered high grade lead-zinc mineralization in the Ogilvie Mountains.

In the MacMillan Pass area, Ogilvie Joint Venture drilled a lead-zinc-barite zone on the JASON Group which is similar to the neighbouring TOM Deposit of Hudson Bay Mining and Smelting.

Cyprus Anvil and Hudson's Bay Oil and Gas drilled the MM volcanogenic lead-zinc-silver deposit in the Seagull Creek area.

Uranium exploration companies moved into the Yukon in 1976 and staked or acquired a number of properties in various mining districts.

Nanisivik mine's loading facilities on the shore of Strathcona Sound, Baffin Island. The ore storage warehouse is 225 metres long, can hold 150 000 metric tons of ore concentrate. The 1976 product was stockpiled here until the start of the 1977 shipping season.



Canada's northernmost operating mine went into production last October. Nanisivik, located on Strathcona Sound, an inlet on the west shore of the Borden Peninsula on Baffin Island, will ship 100,000 tons of lead and zinc concentrate during the 1977 two-month shipping season.

Nanisivik Mines Ltd. came into being in 1974 with the signing of an agreement between the federal government and Mineral Resources International Ltd. of Calgary. Under this agreement, the federal government invested \$18.3 million to provide townsite development, dock and airport facilities, and roads. In return for this funding of infrastructure costs, the federal government acquired an 18 per cent equity interest in the company. Mineral Resources International owned 59.5 per cent, and Metallgesellschaft A.G. of Germany and Billiton B.V. of Holland, 11.25 per cent each.

The discovery of mineral potential in the Strathcona Sound area goes back to 1910-11 when a prospector with a Geological Survey of Canada expedition found a deposit of pyrite with minor sphalerite and galena. The Texas Gulf Sulphur Company began staking there in 1957 from which date they carried out extensive exploration work. Work consisted of geophysical surveys, geological mapping and about 90,000 feet of diamond drilling resulting in the discovery of six million tons of zinc-lead ore averaging 16 per cent combined zinc and lead and two ounces of silver per ton. In 1972 Mineral Resources International Limited of Calgary (MRI) took an option on the property leaving Texas Gulf Sulphur a 35 per cent royalty interest in the project should the option be exercised and the property put into production.



Attracted by the rising prices of zinc and lead, MRI engaged the firm of Watts, Griffis, and McQuat to carry out a detailed feasibility study. This study was completed in September, 1973, and indicated the project was commercially viable as a bunkhouse operation with an eight-year life span. Government infrastructural assistance would be required to provide for a more permanent operation (12-15 years) offering significant economic and employment benefits to the region. In carrying out the feasibility study the consulting firm examined the nature and extent of this kind of assistance previously granted by government to other mining ventures in the Territories, such as at Pine Point in the Northwest Territories and at Anvil in the Yukon, and patterned its assessment along these lines.

On the basis of this report MRI proceeded to search for private and public financial support. Tentative private financing was arranged with two European smelting groups, Metallgesellschaft A.G. in West Germany, and Billeton B.V. in The Netherlands, and an approach was made to the Canadian Government for public infrastructural assistance.

In 1972 the Canadian Government had set out its policy for northern development in a document titled "Canada's North 1970/80". It emphasized that the needs of the native people of the north would require priority attention so that they would not be left behind in the transition which was taking place around them as a result of economic development. They would need to be fully involved; participating in and benefiting from any resource development in the Territories. At the same time the environmental conscience of the nation had been aroused and the document recognized also the need to prevent unnecessary or irreversible damage to the environment in the course of resource development.

The approach from MRI for infrastructural assistance came at a time when these elements of the government's northern policy had been explicitly recognized. It was clear that the needs of the people both of Arctic Bay and of Baffin Island as a whole, and concern for any potential environmental damage, would have to be carefully melded with any proposal for the development of this mine. At the same time other national policies were important concerned with the further processing of natural resources in Canada, the encouragement of the Canadian shipping industry, and the maximum use of Canadian materials, skills, and manpower.

In the greater context of the Canadian mining industry, the Nanisivik mine is not a large project but it is a significant one in terms of northern development. It contains elements of government-industry co-operation not previously attempted. It is an endeavour to meet, within a private enterprise framework, the government's objectives for northern development and to create an industrial venture in the north conforming as nearly as possible to the preferences and aspirations of the native people. It will offer them an alternative to hunting, trapping and carving, an option hopefully not totally alien to their culture but one which will adapt itself to the culture, and to which they in turn can adapt.

Igloo-shaped structure is a social centre of isolated Nanisivik mine on Baffin Island. The administrative quarters are attached to it. The "Dome" contains a cafeteria plus recreational and exercise facilities.



Northwest Territories

Mining Production

Production came from seven mines producing lead, zinc, copper, gold, silver and tungsten. The value of mining production in the Northwest Territories in 1976 was \$185,158,000 — up from \$182,069,944 in 1975 — an increase of 1.69 per cent. Lead and zinc accounted for 79 per cent of the value of production in 1976.

There were 1,592 people employed by the producing mines in 1976.

Lead-zinc

Pine Point Mines Ltd.

Pine Point had a reduced volume of lead concentrate sales and higher production costs due to increased shipping activity associated with the mining of deeper-seated orebodies. This resulted in a lower earnings report for 1976.

Pine Point Mines Ltd.

Type:	Open-pit and underground
Location:	South shore of Great Slave Lake, 80 km east of Hay River
Product:	Zinc-lead
Rate:	10 187 tonnes per day
Tons Milled:	3 422 867 tonnes
Reserve Grade:	2.0 per cent lead and 5.4 per cent zinc
Reserves:	32 840 000 tonnes
Employees:	684

Nanisivik Mines Ltd.

This company began production in September, 1976 and has been stockpiling concentrates awaiting the 1977 shipping season.

Nanisivik Mines Ltd.

Type:	Underground
Location:	29 km northeast of Arctic Bay
Product:	Zinc-lead
Rate:	1 300 tonnes per day
Tons Milled:	Not known
Reserve Grade:	14.1 per cent zinc, 1.3 per cent lead and 61.71 grams silver per tonne
Reserves:	6 323 143 tonnes
Employees:	116

Gold

Giant Yellowknife Mines Ltd.

Production came from underground at Giant, Supercrest, and Lolor mines and from an open pit near the south end of the Giant property. Mill throughput increased in 1976 with the open pit contributing 41 per cent of the total tonnage. The average grade of ore milled was slightly lower than in 1975, while the gold production increased.

Giant Yellowknife Mines Ltd.

Type:	Underground and open-pit
Location:	2.4 km north of Yellowknife
Product:	Gold-silver
Rate:	1 061 tonnes per day (including ore from adjoining Supercrest and Lolor properties)
Tons Milled:	387 512 tonnes
Reserve Grade:	11.66 grams gold per tonne
Reserves:	1 374 400 tonnes
Employees:	346

Cominco Ltd.: Con-Rycon-Vol Mines

The Con Mine is currently working steeply dipping, narrow gold veins over nine active levels to a maximum depth of 1 493 metres. Workings are now at an excessive distance from the shaft systems and, to reduce operating costs and increase production, a new 1 768-metre vertical shaft is being sunk and is nearing completion.

Cominco Ltd. (Con-Rycon-Vol)

Type:	Underground
Location:	2.4 km south of Yellowknife
Product:	Gold-silver
Rate:	375 tonnes per day
Tons Milled:	137 039 tonnes
Reserve Grade:	20.34 grams gold per tonne
Reserves:	1 333 575 tonnes
Employees:	238

Silver-copper

Echo Bay Mines Ltd.

Echo Bay Mines is still mining and milling 91 tonnes of ore a day. The company has completed dewatering the shaft at the nearby original Eldorado Nuclear radium-uranium-silver mine to a depth of 259 metres. While exploration continued, some initial development work was carried out but the company has not yet added significantly to the ore reserves.

Echo Bay Mines Ltd.

Type:	Underground
Location:	Port Radium
Product:	Silver-copper
Rate:	102 tonnes per day
Tons Milled:	35 732 tonnes
Reserve Grade:	Not known
Reserves:	Not known
Employees:	115

Terra Mining and Exploration

Silver production from the Silver Bear Mine greatly increased over the 1975 production. Proven and probable reserves have been upgraded as a result of a raise in the No. 10 vein from the 8th level, and it is expected that these figures will again be upgraded as the drift on the No. 11 vein on the new 9th level reaches the projected downward extension of the ore-bearing lens. Attempts are being made to recover bismuth in a saleable form from the ore.

Terra Mining and Exploration Ltd.

Type:	Underground
Location:	16 km south of Great Bear Lake
Product:	Silver-bismuth-copper
Rate:	170 tonnes per day
Tons Milled:	41 813 tonnes
Reserve Grade:	Not known
Reserves:	Not available
Employees:	53

Northrim Mines Ltd.

The company reopened the Silver Bay Mine which had previously ceased production in June, 1972. The mine began production in October at a rate of 45 tonnes per day. Concentrates were stockpiled for transport to Yellowknife over a winter road.

Northrim Mines Ltd.

Type:	Underground
Location:	9 km east of Terra
Product:	Silver-copper-bismuth
Rate:	45 tonnes per day
Tons Milled:	Not known
Reserve Grade:	Not known
Reserves:	Not known
Employees:	25

Tungsten

Canada Tungsten Mining Corporation

Sales volume and prices of tungsten concentrates from the Cantung mine improved during 1976. The record high production of tungsten concentrates during the year reflected improvement in tonnage and grade control in the mine and improved recovery in the mill. The total ore production for the year was 171 400 tonnes.

Canada Tungsten Mining Corporation Ltd.

Type:	Underground
Location:	Tungsten, N.W.T.
Product:	Tungsten-copper
Rate:	468 tonnes per day
Tons Milled:	171 400 tonnes
Reserve Grade:	1.55 per cent tungsten trioxide and 0.23 per cent copper
Reserves:	3 801 234 tonnes
Employees:	156

Mineral Exploration

Expenditures on mineral exploration in the Northwest Territories continued at a high level in 1976, probably exceeding the \$25 million estimated to have been spent in 1975. Only in the Arctic Islands was there a decline. Significant and new discoveries and new emphases emerged in other areas to keep expenditures equal to, or raise them above, 1975 levels.

There were significant increases in uranium exploration throughout the Territories with major expenditures in the Keewatin and in the immediately adjacent southwest Mackenzie District. Discoveries on Pan Ocean ground near Baker Lake have added impetus to this activity.

Uranium possibilities in the Aphebian sediments on the Kilohigok Basin in the Bathurst Inlet area have become an important target. Uranium is reported in highly-fractured rocks in a large graben subsidiary to the Bathurst Trench.

Base metal-silver targets in volcanic rocks in the Slave Province continued to excite interest, and Texasgulf added to the reserves of the Izok Lake deposit. The focus of greenstone belt exploration has shifted westward in the last year but further discoveries can be expected on the eastern side of the Province.

Discoveries during the last 20 years in the northern Slave Province and adjacent northern Bear Province suggest a need for a new transportation route across the barrens to provide access to the sea at or near Baker Lake. This would permit relatively inexpensive movement of bulk materials and facilitate the development of mineral deposits in the Coppermine, High Lake, Izok Lake and Hackett River areas.

In the mountains widespread investigation of the copper potential of carbonate members within predominantly clastic, late Proterozoic units, replaced lead-zinc as the major activity, but the latter continued at a high level and some new lead-zinc discoveries may be announced in the near future.

Discoveries by Western Mines west of Pine Point give promise for new mining ventures in the Territories' most important mineral producing area.

Gold and silver

Precious metals exploration in the N.W.T. declined to a low level. It is concentrated in the Bear and Slave Geological Provinces where the major expenditures were at the Con and Giant mines.

Keewatin Region

A small crew improved the road from the Cullaton Lake airstrip to *O'Brien Gold Mines Ltd.*'s mine (1).

Bear — Slave Region

Duke Mining Ltd. and *Terra Mining and Exploration Ltd.* continued underground exploration on their Bullmoose Lake property (35).

Cominco Ltd. continued shaft sinking at the Con Mine (37) and drilled on the Kamcon property (37).

Geophysical Engineering Ltd. completed EM and magnetometer surveys on the YT group (37), optioned from the Nugget Syndicate.

Giant Yellowknife Mines drilled four holes to test the Crestaurum shear zone (37) at depth and drilled 18 holes in a continued evaluation of the Salmity property (44). Giant continued surface drilling on its Yellowknife mining leases during the year to outline additional ore reserves.

Texasgulf Inc. drilled a gold prospect between Point and Itchen Lakes (60).

Terra Mining and Exploration Ltd., *Sunshine Mining Company Ltd.*, and *Du Pont of Canada Exploration Ltd.* flew EM-magnetic-scintillometer surveys to locate sulphide zones which can have associated silver-bearing veins. The project was managed by *Du Pont* (77).

Nahanni Region

A DIAND field crew panned trace amounts of flour gold at the mouth of the River Between Two Mountains, a long-known occurrence (85).

Base metals

Keewatin District

Essex Minerals Company Ltd. did ground geophysical surveys and 588 m of diamond drilling on five geophysical anomalies in the Quartzite Lake (3) and Heninga Lake (6) areas.

Noranda Exploration Company Limited drilled 366 m in three holes in the Maze Lake area (3) and one hole in the Kaminak Lake area (4) to explore EM anomalies. The results were not encouraging. *Noranda* mapped the greenstone belt southeast of Yathkyed Lake (7) and the copper showings, explored by Canadian Nickel Company Limited in 1964, on Angikuni Lake (9).

St. Joseph Explorations Ltd. conducted geochemical, ground EM and magnetometer surveys in the Henning Lake area (6) over anomalies detected by the 1975 airborne survey. Fourteen holes were drilled on geophysical anomalies and seven on the Gemex massive sulphide deposit, a total of 2 743 m of drilling.

Cominco Ltd. surveyed the DEE claims at Spi Lake (5) with magnetometer and EM equipment. The geology of the claims was mapped and the base-metal potential of the area and that of the Baker Lake (15) area were assessed.

Arctic Islands

Reconnaissance mapping and prospecting explored for Pb-Zn on **Cominco Ltd.**'s prospecting permits near Clyde River (23).

In the fall, **Nanisivik Mines Ltd.** commenced mining lead-zinc at the Strathcona Sound deposit (J).

In March and April, **Canadian Superior Exploration Ltd.** did rotary drilling on its SUP claims northeast of Resolute Bay (27).

Slave Lake Area

Western Mines Ltd. and **Du Pont of Canada Exploration Ltd.** report 2.5 million tonnes of drill indicated material averaging 4.1 per cent lead and 11.9 per cent zinc on their claims west of Pine Point (30).

Pine Point Mines Ltd. continued routine exploration on its Pine Point claims (30) and staked additional claims. They also staked more claims in the Windy Point area (29).

Bear-Slave Provinces

Shell Canada Ltd. explored for base metals in the East Arm Subprovince (32).

Norcen Energy Resources Ltd. drilled one hole on the BBX property (33), a continuation of a 1975 program by **Great Plains Development Company of Canada Ltd.**, which company was acquired by **Norcen** in 1975. Exploration by **Norcen** included geochemical rock and gossan sampling near Chalco Lake (42), geochemical rock and gossan sampling and a small amount of geophysics in the Muskox Lake area (47), geological and rock geochemical surveys in the vicinity of Point Lake (60), and staking, EM surveying, and trenching on a sphalerite-chalcopryrite-pyrrhotite occurrence, located through rock geochemistry on the James River (67).

Two men from **Hudson's Bay Oil and Gas Ltd.** reconnoitred the geology of prospecting permit 432 north of the eastern end of Point Lake (53) and of Alymer Lake (45), Uist Lake (48) and Beuparlant Lake (51) areas.

Long Lac Mineral Exploration Ltd. staked claims on and adjacent to its prospecting permits 336 and 337 (56, 66).

St. Joseph Explorations Ltd. did geological and geochemical surveys at Victory Lake (36).

EM, magnetometer and geological surveys by **Kennco Explorations (Canada) Ltd.** explored the **Windflower Mines Ltd.** property at Clinton Colden Lake (46).

Noranda Exploration Company Ltd. continued investigations of the base metal potential of Slave Supergroup volcanic rocks at Aylmer Lake (45), Indin Lake (42), and around Point Lake (60). **Noranda**, **Cominco** and **Texasgulf** have staked claims in an arcuate belt north-east of Point Lake (53, 54, 55). **Noranda** drilled the HI and AMISK Groups (69). Diamond drilling and an IP survey tested **Noranda's** SUE-DIANNE property (40).

Cominco Ltd. continued its wide ranging exploration in the Mackenzie Region. Bases at Rae (38) and near Lac La Martre (72) were used for regional reconnaissance. Geological and geophysical surveys and trenching explored a galena-sphalerite showing on the PALE group (47), and trenching tested the nearby BACK group. Numerous claims were staked by **Cominco** between Contwoyto and Itchen Lakes (54, 55) along an arcuate belt containing metavolcanics. Part of this belt (55) was mapped, as was an area near Scotstoun Lake (63) and Irritation Lake (62). At the Bathurst Norsemimes option (49), relogging of drill core continued and detailed geological surveys filled gaps in map coverage.

A preliminary economic study of the Bathurst Norsemimes property (49), by Wright Engineers Ltd. for **Bathurst Norsemimes Ltd.** gave reserves of 19.5 million tonnes in six zones having an overall average grade of 0.44 grams/tonne gold, 149.51 grams/tonne silver, 0.41% copper, 0.75% lead, and 4.98% zinc.

Western Mines Ltd.'s (Brascan Resources Ltd.) work on the Yava property (48) was reduced compared with 1975. Geological, geophysical and geochemical surveys around the Main Zone were carried out.

Geological mapping, EM surveys and trenching by **Du Pont of Canada Exploration Ltd.** on various claim groups in the Back River-Muskox Lake area (47) tested anomalies identified by 1974 airborne surveys.

The Nanisivik townsite comprises both family units and a bunkhouse operation for single employees.



Texasgulf Inc. resumed drilling at Izok Lake (58) where over 10.9 million tonnes grading 13.7% Zn, 2.82% Cu, 1.42% Pb, and 70.14 grams/tonne Ag have now been outlined. Farther north drilling and geophysics continued on targets in volcanics on what was previously a **Texasgulf** prospecting permit (57). Two small drilling projects were executed on the PAN and PAR-PAL groups (69, 71) and extensive staking and preliminary exploration followed airborne surveys west of Contwoyto Lake (53, 54, 55). **Texasgulf** also drilled a few holes into an extensive gossan on the INC group (52), and did reconnaissance around Canoe Lake (65).

Giant Yellowknife Mines Ltd. drilled gossans in volcanics north of the Acadia gold property (70).

Nahanni Region

Nahanni Placers and **Cambria Exploration** completed prospecting and soil/stream geochemical surveys of shales on prospecting permit 424 (86).

Golden Ram Resources drilled at least five holes on its Alpha Bravo property (89) to test lead and zinc occurrences in metamorphosed Road River shale.

Serem Management mapped and trenched anomalous areas in the Road River-Besa River shales on the NOR claim group (89). The TICK group (98) was mapped and prospected and selected areas of the shales in the Selwyn Basin were examined.

Diamond drilling, geochemical surveys, trenching and geological mapping explored the OP, XY and ANNIV claims (90) as part of the **Canex Placer-U.S. Steel Western Hemisphere Ltd.** continued effort to outline lead-zinc mineralization in the Road River shales.

Prospecting, geochemical and geophysical surveys, geological mapping and diamond drilling tested **Shell Canada's** Keele permit area (93) and the Coates Lake property (88). Regional prospecting and geological mapping, part of the search for stratabound copper deposits in carbonates of the Redstone and Copper Cap Formations, extended from the Twitya River to Coates Lake.

Geological mapping, geochemical surveys and prospecting covered parts of **Canadain Nickel's** JOE and DAL claims (92) which were acquired last fall in the staking rush that followed the release of Geological Survey of Canada Open File 298. The TET-RAP claim group (94) optioned from Welcome North was explored by IP survey and a diamond drill hole tested an anomaly outlined by the survey. The target was apparently copper-lead-zinc mineralization in the Copper Cap Formation.

Geological and geochemical surveys by **Cominco Ltd.** on the CAP claims (92) were followed by drilling of lead-zinc in a solution-collapse breccia in Landry Formation. The ADYJO claims (92) which partly cover the Redstone and Copper Cap formations, were geologically mapped and prospected. **Cominco** also did regional surveys in the Carcajou Canyon area.

Rio Tinto Canadian Exploration mapped and prospected the EE, DB, CL and BP claims in the Hayhook Lake area (92), which cover copper mineralization in the Redstone-Copper Cap formations. Extensive diamond drilling on the RT group in the Gayna River area (99), explored lead-zinc mineralization in several types of breccias associated with well-developed Helikian stromatolitic reefs.

St. Joseph Exploration Ltd. reviewed many of Welcome North's carbonate hosted lead-zinc occurrences in the Godlin Lakes region (95).

The ANT claims (94) were staked for **Canico** during a regional search for mineralization in extensions of the Redstone Formation in the Mount Eduni area.

Bethlehem Copper drilled at least three holes on the BEAR-TWIT property (96) to test the depth potential of lead-zinc in Ordovician-Silurian carbonates.

Welcome North Mines Ltd. mapped and prospected the REV group (97) and extended detailed mapping and prospecting on the AB claims (100), where several new occurrences of lead-zinc were found. The Road River-Besa River shales in the Bonnet Plume area were explored for stratiform lead-zinc.

Cordilleran Engineering appraised the regional possibilities of Road River and Besa River shales in the Selwyn Basin.

Uranium

Keewatin District

Geochemical, geophysical and geological surveys covered **Noranda Exploration Company Limited** claims and uranium showings in Dubawnt Group sediments in the Yathkyed-Tulemalu lakes area (8). Radiometric surveys were flown and numerous claims staked.

Claims in the Yathkyed-Tulemalu lakes area (8) were mapped and surveyed with radiometric instruments by **Essex Minerals Company Ltd.**

Geological and geophysical surveys were done on **Pan Ocean Oil** claims in the Yathkyed-Tulemalu lakes area (8) and a radiometric survey of its prospecting permits at Tulemalu and Yathkyed lakes was flown by Kenting Earth Sciences Ltd.

Reconnaissance and detailed geochemical, geophysical and geological surveys covered **Urangesellschaft Canada Limited** claims and adjacent areas in the Yathkyed-Tulemalu lakes area (8). Airborne radiometric surveys and reconnaissance geochemical lake water and sediment surveys were carried out on **Urangesellschaft's** prospecting permits southwest of Dubawnt Lake (12).

A second **Urangesellschaft** crew completed evaluation of prospecting permits in the Sissons-Baker Lake area (17, 18) and flew reconnaissance radiometric and geochemical studies on the company's permits and the adjacent areas northwest and southwest of Baker Lake (20, 14).

Shell Canada Ltd. mapped and tested its prospecting permits to the east and south of Dubawnt Lake (10) and west of Yathkyed Lake (8) with airborne and ground radiometric surveys and lake sediment geochemical surveys. Detailed radiometric geological surveys explored uranium showings on the BAK claims(13).

A crew based at Baker Lake flew radiometric surveys on **Uranerz Exploration and Mining Ltd.**'s prospecting permits south of Garry Lake (21) and west of Dubawnt Lake (11). A second crew surveyed the geology of the edge of the Thelon Basin and surveyed the geochemistry of water and sediments in nearby lakes.

Brascan Resources Ltd. investigated the uranium potential of the Kinga Lake (6) area and then conducted detailed and reconnaissance geological and geochemical surveys of its prospecting permits near Amer Lake (19).

Union Oil Ltd., operating out of Baker Lake, completed studies of the **Rio Alto Explorations Ltd.** prospecting permit southwest of Baker Lake (16) and assessed the potential of the area.

A large **Cominco Ltd.** crew at Kazan Falls (15) engaged in detailed geological and geophysical surveys of the area southeast of Baker Lake. Some 915 m of additional diamond drilling probed the main showing explored in 1975. A smaller crew investigated the uranium potential of the Snowbird Lake (2) area and the Baker Lake region.

Arctic Islands

Detailed geological and ground radiometric surveys covered **Imperial Oil Ltd.**'s claims northeast of Cape Dorset (22).

Noranda Mines Ltd. did reconnaissance radiometric surveys on northern Baffin Island between Pond Inlet and Fury and Hecla straits (24).

Uranerz Canada Ltd. and **Trigg Woollett Associates** each did a brief uranium reconnaissance of parts of Victoria Island (28).

South Slave Lake

The release of results of a lake sediment geochemical survey of a large area centered on Nonacho Lake (31) by the Geological Survey of Canada in May prompted a minor staking rush. **Brascan Resources Ltd.**, **Imperial Oil Ltd.**, **Trigg Woollett Associates**, **Denison Mines Ltd.**, **Canadian Occidental Petroleum** and several individuals took part. **Mattagami Lake Mines Ltd.** also had exploration crews in the area. **Saskatchewan Mining Development Corp.** staked claim groups northeast of Fort Smith (31) in the same general area.

East Arm Subprovince

Halferdahl and Associates reconnoitered the East Arm Subprovince (32) for an undisclosed client.

At Meridian Lake and Charlton Bay (32) **Rio Tinto Canadian Exploration Ltd.** continued track etch surveys begun in 1975.

Brascan Resources Ltd. prospecting the Reliance area (32) of the East Arm where they investigated lake sediment anomalies reported in a recent Geological Survey Open File release.

Geological mapping and diamond drilling by **Seru Nucleaire** tested the Vestor option on Simpson Island (34). **Seru** staked the SBI and JG groups in the Bathurst Inlet area (50) following airborne reconnaissance and radiometric surveys. Helicopter-borne radiometric surveys and geological reconnaissance covered **Seru's** Prospecting Permits 428 and 429 near Point Lake (61) and 430 and 431 near Melville Creek (81).

Geological, geophysical, and geochemical surveys by **Uranerz Canada Ltd.** on parts of the JONES group (31) and airborne radiometry of several areas in the Bear Province, and areas in the Slave Province north and south of Takijug Lake (64) were conducted from Echo Bay (78). Prospecting, geophysics, geochemistry and property evaluation were done from a camp on Hottah Lake. Geological, geochemical and geophysical surveys explored **Uranerz's** prospecting permit (68) and adjoining claims.

A six-hole, 230-m drill program was underway in October on **Andex Mines's** uranium property near Slemon Lake (39).

The **Aquitaine Company of Canada Ltd.** staked one small claim group after an airborne radiometric survey. Radiometric prospecting covered **Aquitaine's** PEC group near Dismal Lakes (80).

Geological and scintillometer surveys and trenching tested the Vaylo option north of Rae (39) for **Cleaver Lake Mines Ltd.**

Rayrock Mines Ltd. optioned the Crestland uranium property (40) and began mapping, prospecting and scintillometer surveys.

From a base at Basler Lake (41) **Conwest Exploration Company Ltd.** sampled sediment in lakes on Snare Group rocks.

Noranda Exploration Company Limited has been acquiring ground in the Bathurst Inlet area (50) following 1975 airborne radiometric and geochemical surveys. Evaluation of some of **Noranda's** anomalies in this area began. Drilling, geological and geochemical surveys tested **Noranda's** six prospecting permits on Leith peninsula (74, 75) which cover a ridge of Aphebian granitic rocks surrounded by Helikian Hornby Bay Group supracrustals and Phanerozoic sediments.

Following geological reconnaissance and ground geographical prospecting in the Kilohigok Basin, *Essex Minerals Co. Ltd.* staked in two areas along a graben (50) near the mouth of the Burnside River and near Bathurst Lake. Claims were also staked 40 km southwest of Bathurst Lake (49) on ground mainly underlain by the Western River Formation, basal member of the Proterozoic Goulburn Group.

A large *Cominco Ltd.* camp at Salamander Lake (50) was a base for regional geological and airborne radiometric surveys. *Cominco*, early arrival in the Bathurst Trench, holds only the POMIE group at Bathurst Lake and the JCW group just west of Salamander Lake. Trenching, geophysical and geological surveys tested these groups. Airborne radiometric surveys, geological mapping and prospecting explored *Cominco's* prospecting permits. The KUM group showing, which lies on the common boundary of the permits, was trenched (79).

A small *Chevron Standard Minerals Ltd.* crew did lake sediment, geological and geophysical surveys in parts of the Bear Province from a base at Hottah Lake (76).

Additional drilling tested *Imperial Oil Ltd.*'s YUK group (83) which was greatly enlarged by staking additional claims to the northeast, extending the block to the shores of Dismal Lakes.

BP Minerals drilled its claims near Mountain Lake (83), near the Aquitaine and Imperial Oil properties, and mapped the contact of the Hornby Bay Group and the Hepburn Batholith on Prospecting Permits 393 and 394 (79).

Other minerals

Arctic Islands

Diapros Canada Ltd. collected heavy mineral samples in a search for kimberlite on Somerset Island (26).

Interior Plains

Phoenix Canada Oils Co. obtained coal leases in the Scented Grass Hills on the west side of Great Bear Lake (84).

Extensive gravity surveys between Great Bear Lake and the Arctic Coast (85) by *Photogravity Surveys Ltd.* may be of use in minerals exploration. These surveys were done in 1976 to sell to oil and gas exploration groups.

Nahanni Region

Amax Exploration continued development at the Mactung tungsten property (91) in preparation for a tentative planned opening in late 1981 or early 1982.

Yukon Territory

Mining Production

The value of mining production sales in the Yukon decreased by 43 per cent from \$228,659,000 in 1975 to \$130,469,000 in 1976. Production came from five mines which produced lead, zinc, copper, silver, cadmium, gold, asbestos and coal.

There were 1 246 persons employed by the producing mines in 1976, a decrease of 109 persons over the 1975 figure.

Lead-zinc-silver

Cyprus Anvil Mining Corporation

Cyprus Anvil Mining Corp. recorded a net loss in 1976. The operations were severely affected by strikes which resulted in mine and mill shutdowns over almost 50 per cent of the scheduled operating time. The intermittent nature of the operation adversely affected performance during the operating periods. As a result, the average daily throughput was less than designed capacity.

Cyprus Anvil Mining Corporation

Type:	Open-pit
Location:	209 km northeast of Whitehorse
Product:	Zinc, lead, silver, gold
Rate:	8 172 tonnes per day
Tons Milled:	1 519 896 tonnes
Reserves:	40 551 574 tonnes
Reserve Grade:	3.1 per cent lead, 5.5 per cent zinc, 31.1 grams per tonne silver
Employees:	485

Silver-lead-zinc-cadmium

United Keno Hill Mines Ltd.

United Keno Hill Mines was hit by a strike from July 29 to September 11, 1976. Earnings were down due to lower tonnage, grade, and silver prices. Tonnage was down because of the strike and because fewer high-tonnage mining areas were available for mining, while grades were lower due to the effect of milling 4 545 tonnes from low grade waste dumps to provide backfill for Husky mine stopes.

United Keno Hill Mines Ltd.

Type:	Underground
Location:	50 km northeast of Mayo
Product:	Silver, lead, zinc, cadmium
Rate:	217 tonnes per day
Tons Milled:	68 507 tonnes
Reserves:	91 606 tonnes
Reserve Grade:	4.8 per cent lead, 1.3 per cent zinc, 1 413 grams per tonne silver
Employees:	280

Mount Nansen Mines Ltd.

The Huestis Mine was reopened in 1975 and operated for 10 months in 1976, terminating in October. A total of 7 435 tonnes was mined at a rate of 25 tonnes per day. The mill was started up in June and operated at 59 tonnes per day until cessation of operations five months later.

Mount Nansen Mines Ltd.

Type:	Underground
Location:	48 km west of Carmacks
Product:	Silver, lead, zinc
Rate:	59 tonnes per day
Tons Milled:	5 833 tonnes
Reserve Grade:	Not known
Reserves:	Not known
Employees:	Not known

Copper

Whitehorse Copper Mines Ltd.

For the year 1976, net earnings were increased over those of 1975. Tons milled rose to 728 182 tonnes from 670 909 tonnes in 1975 and the grade improved to 1.69% copper from 1.52%. Installation of the crusher on the 1 300 level has started and is expected to improve production efficiency by about 15%. The mine was hit by a two-month strike during the summer which resulted in a loss in the third quarter of the year.

Whitehorse Copper Mines Ltd.

Type:	Underground
Location:	11 km south of Whitehorse
Product:	Copper, silver, gold
Rate:	2 523 tonnes per day
Tons Milled:	726 514 tonnes
Reserves:	2 450 012 tonnes
Reserve Grade:	2.28 per cent copper
Employees:	202

In Canada's most northerly metal mine, variations in the metal content of Nanisivik mine ore are monitored in this lab before going on to the concentration mill. Nanisivik began operations in 1976 beside Strathcona Sound on Baffin Island



Asbestos

Cassiar Asbestos Corporation

The Clinton mine performed well in 1976. The production was ahead of schedule and the net profit was up 43% from 1975. The total fibre production is estimated at 102 727 tonnes, down 1.2% from the 1975 production.

Cassiar Asbestos Corporation Ltd.

Type:	Open-pit
Location:	80 km north-west of Dawson City
Product:	Asbestos fibre
Rate:	4 633 tonnes per day
Tons Milled:	1 323 306 tonnes
Reserves:	3.5 million tonnes at 4.8 per cent fibre
Employees:	313

Coal

Tantalus Butte Coal Co.

Tantalus Butte decreased its total production in 1976 to 9 068 tonnes. This decrease of 61.2 per cent from the production in 1975 resulted from the strike at Cyprus Anvil, the parent company, which uses the coal to dry concentrates.

Tantalus Butte Coal Co.

Type:	Underground and surface stripping
Location:	Carmacks
Product:	Coal
Rate:	56 tonnes per day
Tons Produced:	9 046 tonnes
Reserves:	Not known
Reserve Grade:	Thermal coal
Employees:	17

Mineral Exploration

In 1976, some \$16 million was spent on mineral exploration in the Yukon. This is a decrease of roughly \$2½ million from the \$18½ million estimated to have been spent in 1975. This decrease is due, at least in part, to an increase in activity in British Columbia. While this trend may be expected to continue in the near future, largely because of significantly cheaper operating costs in B.C., there have been recent developments in the Yukon which are expected to keep exploration activity at a fairly high level, at least for the next few years.

The main areas of interest in 1976 were the Anvil Range area (Whitehorse Mining District), the Seagull Creek and Howard's Pass areas (Watson Lake Mining District) and the Bond Creek-Quartet Lakes and MacMillan Pass areas (Mayo Mining District).

Copper and Molybdenum

Whitehorse Mining District

Whitehorse Copper Mines Ltd. continued exploration work in the Whitehorse Copper Belt west of Whitehorse. Diamond drilling was carried out on the Arctic Chief and North Star claims (101). Ore bodies in the Whitehorse Copper Belt consist mainly of bornite and chalcopryite in skarn zones developed in limestones adjacent to diorite to granodiorite intrusions.

Whitehorse Copper Mines Ltd. also carried out 472 m of diamond drilling on the Kreft-Takacs property (101).

United Keno Hill Mines Ltd. carried out a feasibility study on the Minto (102) copper deposit jointly owned by *United Keno*, *Falconbridge Nickel Mines Ltd.*, *Canadian Superior Exploration Ltd.*, *Asarco Incorporated* and *Silver Standard Mines Ltd.* The feasibility study indicated that production was unfavourable at current metal prices. The deposit is estimated to contain in excess of 7.3 million tonnes of 1.8 per cent copper with minor gold and silver.

United Keno Exploration conducted an induced polarization survey on the FED claims in the Minto area (102).

United Keno Exploration also staked the HI claims and carried out geological mapping and soil sampling (102).

Amoco Canada Petroleum Company Ltd. carried out 565 m of diamond drilling on the PATT claims in the Dawson Range. This company also did 598 m of diamond drilling on the CC claims and 153 m on the DOYLE claims (103).

Western Mines Ltd. did 740 m of diamond drilling on the Maloney Creek (102) porphyry prospect.

Western Mines Ltd. carried out geological mapping and a magnetic survey on the M claims northwest of Kluane Lake (104). Copper sulphides occur in veinlets cutting Permian volcanics.

Anglo American Corporation of Canada Exploration Ltd. carried out a geochemical survey on the SAM claims (103).

Klotassin Joint Venture continued geological mapping, soil sampling and magnetic surveys on the ROC, JEN and SKUNK claims (102).

Dawson Mining District

Rio Tinto Canadian Exploration Ltd. drilled approximately 1 219 m of core on the Lucky Joe property (105). Mineralization consists of disseminated chalcopryite and pyrite in Klondike schist of the Yukon Metamorphic Complex.

In the Dawson Range *Kerr Addison Mines Ltd.* carried out an IP survey in Triassic volcanics on the WON claims (102).

Mayo Mining District

Cyprus Anvil mapped geologically and soil sampled the GREMLIN property (106) in the Margaret Lake area. Chalcopryite occurs within breccia and sedimentary rocks.

Lead-zinc-silver

Whitehorse Mining District

Exploram Minerals Ltd. did 305 m of drilling on the SM claims (107) northeast of Whitehorse. Galena and sphalerite occurs as blebs, stringers and disseminations in brecciated graphitic slate and phyllite.

Tinta Hill Mines Ltd. did 305 m of drilling on the Tinta Hill property (102) in the Dawson Range. Lead and zinc sulphides occur in quartz-carbonate veins in a 30-metre-wide shear zone.

Utah Mines Ltd. carried out geological mapping, soil sampling and electromagnetic, magnetic and gravity surveys on the AU and BRIE claims (108). Over 610 m of diamond drilling was performed. No significant mineralization was encountered.

Noranda Exploration Company Ltd. conducted geological mapping and geochemical sampling on its Pass Peak property (109). Minor amounts of sphalerite were found in Devonian dolomite.

Makir Mining Ltd. carried out gravity surveys on its CIVI, KO and MING properties in the Anvil District (110).

Preussag Canada Ltd. carried out a program of geochemical and geophysical surveys on the CAT claims (110).

Cyprus Anvil carried out an extensive program of deep diamond drilling and gravity surveys in the Anvil District on many of its claim groups (110).

In the vicinity of the GRUM and Vangorda massive sulphide deposits, **Canadian Natural Resources** conducted a program of Turam and gravity surveys as well as some diamond drilling on its Vangorda option (110).

Olympian International Resources drilled two holes that intersected some minor mineralization in cherty volcanics on the NESO claims (110).

Welcome North Mines, in a joint project with **Getty Mining Pacific**, conducted a vigorous program of geophysics and diamond drilling on a large number of claim groups for Anvil-type mineralization in the Anvil District (110).

Conwest Exploration Co. Ltd. and **Essex Minerals Ltd.** in their **MacMillan Joint Venture** conducted a large detailed gravity survey on the SUE claim group (111).

Dawson Mining District

Union Miniere Explorations and Mining Corp. Ltd. in conjunction with **Shell Minerals Canada Ltd.** carried out an extensive exploration program called the "Blackstone Project" over several claim groups for lead-zinc in Proterozoic sediments and Cambro-Ordovician carbonates (112).

Rio Alto Exploration Ltd. carried out a mapping and geochemical survey program on the RIO, NATE and CARB claims (113) where oolitic iron formation and Pb-Zn mineralization were found.

Mayo Mining District

Rio Tinto geologically mapped and soil sampled the CORD claim group 11 miles southwest of Fairchild Lake in the Bonnet Plume River area (106). Minor sphalerite and galena occur within quartz veinlets in Helikian shale.

Cominco drilled a further 453 m on the PING claim group located on Black Canyon Creek (114). Galena and sphalerite occur within a breccia in Hadrynian dolomite.

Norcen Energy Resources conducted a short-hole, diamond-drilling program on the LAURA and BUH claim groups (115). Minor galena and sphalerite occur in dolomite on the BUH and hydrozincite in dolomite on the LAURA.

Ogilvie Joint Venture (Mitsubishi, Brinex, Ventures West) conducted 2 134 m of diamond drilling on the JASON claim group in the MacMillan Pass area (116). They encountered a mineralized horizon similar to the lead-zinc-barite zone on the adjoining TOM property of **Hudson Bay Exploration**. In addition, gravity and geochemical soil sampling surveys were conducted over the JASON and also the PETE claims 24 km to the south.

Harman Management conducted a trenching and rock sampling program on the GYR claims in the Snake River area (114) where galena and sphalerite occur as matrix in a limestone conglomerate of Siluro-Devonian age.

Welcome North's **Arctic Red Joint Venture** carried out detailed geological mapping and geochemical soil and rock sampling surveys on the REP claims in the Bonnet Plume River area (114). Mineralization consists of galena and sphalerite in Road River shale and calcareous argillite. In addition, geological mapping and geochemical soil, silt and rock sampling programs were conducted over the PR claims in the Snake River area (114). Mineralization consists of float of lead-zinc-barite in shale of the Besa River Formation.

UMEX carried out detailed geological mapping and soil geochemical sampling on the LAST claims, north of Hart River in the Wernecke Mountains (117).

UMEX carried out soil geochemical surveys on the PAT CAL claims of **Sumitomo Metal Mining Canada Ltd.** located 108 km north-northwest of Mayo in the Ogilvie Mountains (117). No mineralization and only minor anomalies were detected.

U. S. S. R.

70°

80°

APPROXIMATE LIMIT OF PERMANENT POLAR PACK ICE

ARCTIC OCEAN
BEAUFORT SEA

ALASKA

60°

YUKON TERRITORY

NORTHWEST TERRITORIES

PACIFIC OCEAN

BRITISH COLUMBIA

ALBERTA

SASKATCHEWAN

Prince Rupert

Stewart

Fort St. John

Fort Chipewyan

Uranium City

Fort Smith

Hay R. Pine Point

Fort Resolution

Fort Providence

Yellowknife

Fort Nelson

Fort Simpson

Wrigley

Norman Wells

Inuvik

Tuktoyaktuk

Herschel Island

Old Crow

Banks Island

Sachs Harbour

Halman Is.

Victor Island

Mould Bay

Clinton

Dawson

Snag

Carmacks

Haines Junction

Carcroft

Haines

Skagway

Atlin

Juneau

Telegraph Creek

Whitehorse

Johnson's Crossing

Watson Lake

Ross River

Mayo

Elsa

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MINERAL EXPLORATION AND MINING - YUKON & N.W.T.

1976

SCALE OF MILES
0 100 200 300 400

LEGEND



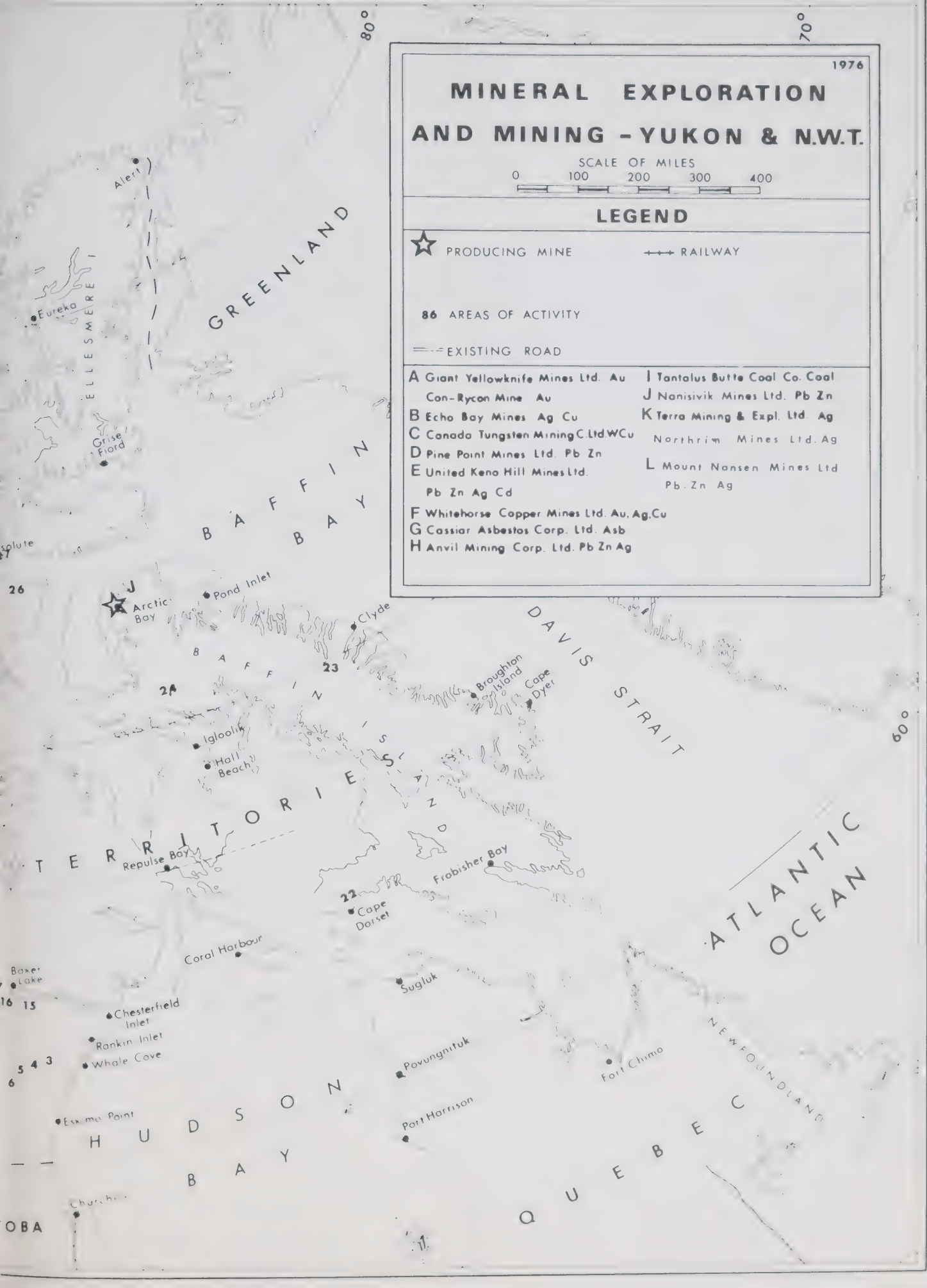
PRODUCING MINE

RAILWAY

86 AREAS OF ACTIVITY

EXISTING ROAD

- | | | | |
|---|---|---|------------------------------|
| A | Giant Yellowknife Mines Ltd. Au | I | Tantalus Butte Coal Co. Coal |
| | Con-Rycon Mine Au | J | Nanisivik Mines Ltd. Pb Zn |
| B | Echo Bay Mines Ag Cu | K | Terra Mining & Expl. Ltd. Ag |
| C | Canada Tungsten Mining C. Ltd. WCu | | Northrim Mines Ltd. Ag |
| D | Pine Point Mines Ltd. Pb Zn | L | Mount Nansen Mines Ltd |
| E | United Keno Hill Mines Ltd. | | Pb. Zn Ag |
| | Pb Zn Ag Cd | | |
| F | Whitehorse Copper Mines Ltd. Au, Ag, Cu | | |
| G | Cassiar Asbestos Corp. Ltd. Asb | | |
| H | Anvil Mining Corp. Ltd. Pb Zn Ag | | |



Watson Lake Mining District

Canex Placer and **U.S. Steel** continued an extensive drilling program on their Howard's Pass properties (118). They made public some drill results in late 1976 which indicated several large zones of shale-hosted, lead-zinc mineralization.

Cyprus Anvil and **Hudson's Bay Oil and Gas Mining Co. Ltd.** conducted a diamond drilling program on the MM volcanogenic lead-zinc-silver deposit in the Seagull Creek area (109).

Tintina Silver conducted further drilling on the silver-lead-zinc property south of Ross River (119).

Noranda conducted programs of geochemical soil sampling, CEM, VLF and gravity surveys over most of the McMillan Property (120) at Quartz Lake, 60 km northeast of Watson Lake. A zone of massive sulphides (mainly pyrite, galena, sphalerite) occurs within calcareous argillite and limestone of Hadrynian age. In addition, geochemical soil sampling and VLF-EM surveys were carried out over the Shannon Creek property (121), 44 km west of Tungsten, N.W.T. Mineralization consists of minor sphalerite, galena, chalcopyrite and scheelite in contact metamorphosed limy Hadrynian sediments adjacent to a Cretaceous granodiorite stock. Silt and soil sampling were also carried out on the NMT claims, 14 km north of McNeil Lake (109). Hydrozincite and minor sphalerite occur in Road River shale. Detailed geological mapping and geochemical soil sampling were conducted over the KET claims at the headwaters of the Ketza River (109) where galena and sphalerite occur in quartz-carbonate veins and breccias.

Hudson Bay Exploration and Development carried out trenching and completed five diamond drill holes on the BEV claims south of the Campbell Highway (109) in Lower Paleozoic schists. However, no economic mineralization was observed. In addition, minor geochemical soil sampling and an airborne EM survey were carried out on the BOW property south of Ross River (119) and just west of the Tintina Silver property.

Dual Resources carried out preliminary geological mapping and grab sampling on the SUZANNE claims (122) where galena and sphalerite occur in a limestone skarn.

St. Joseph Exploration Co. carried out a reconnaissance geochemical soil sampling program for lead and zinc over a portion of the PELLY property (109) owned by **Sovereign Metals Corporation**. Mineralization consists of galena, sphalerite and pyrite in feldspar augen schist.

Welcome North Mines conducted preliminary geological mapping and geochemical soil sampling on the MAT group on the east side of Seagull Creek (109). Mineralization consists of massive and disseminated galena and pyrite within a sequence of slate and felsic volcanoclastic rocks. In addition, geochemical soil sampling was carried out on the SUN and SM claims (109) to the north are also underlain by Mississippian volcanic and associated volcanoclastic and sedimentary rocks. Geology of the area consists of lower Paleozoic carbonate and clastic rocks.

DC Syndicate carried out geochemical soil sampling and an I.P. survey on the BAR claims, 1.6 km east of Wolf River (123). Mineralization consists of barite, marcasite and galena in clastic sedimentary rocks of Upper Paleozoic age.

Yukon Revenue Mines Ltd. carried out trenching and geochemical soil sampling in schist and phyllite on the GEM and BB claims (124) east of Ross River and 16 km north of the Campbell Highway.

Uranium

Whitehorse Mining District

Mitsubishi Metal Corporation carried out a rock geochemical survey on the ML claims in the Aishihik Lake area (125).

Dawson Mining District

Chevron Standard Ltd. conducted a detailed mapping and ground radiometric survey on the "Deadman Stock" which underlies the A, B, and AB claims (112).

In the Blow River area (126), **Aquitaine Company of Canada Ltd.** staked over 1,000 claims in three large blocks; the BOU, BON and NET groups.

Mayo Mining District

Eldorado Nuclear Ltd. optioned uranium properties from Aquitaine-Chevron syndicate managed by Archer-Cathro and conducted diamond drilling on the PTERD (115) and BOND (106) claim groups in the Bonnet Plume River area. Ground radiometric and soil sampling surveys and geological mapping were conducted over the MST claims (106) where minor radioactivity occurs in a brecciated dolomite; over the BROMADROSIS claims (115) where minor brannerite occurs within calcsilicate-altered country rock in contact with an intrusive breccia; over the WERNECKE claims (106) where minor disseminated brannerite occurs within felsic volcanics; over the OTIS claims (106) where minor brannerite occurs within fault breccia; over the FACE claims (106) where brannerite occurs along fractures within a siliceous border phase of a breccia body; over the GNUCKLE claims where minor brannerite occurs in association with fractures and shear zones in breccia

Gold-silver

Dawson Mining District

Cons Acheron Mines Ltd. drilled three holes on the A.J. and UP claims (117) to outline gold mineralization in a vein system.

Watson Lake Mining District

Trident Resources carried out geological mapping, geochemical soil sampling and trenching on a gold-silver-copper prospect, the SEL claims, in the Itsi Range (121). Mineralization consists of arsenopyrite, pyrite and chalcopyrite within quartz veinlets in black shale of Devonian age.

Antimony

Whitehorse Mining District

Con-Am Resources Ltd. conducted geological mapping and a VLF-EM survey on the Becker-Cochran property in the Wheaton River area (127). Similar work was carried out on the DIANE claims (127).

Asbestos

Dawson Mining District

Pan Acheron Mines Ltd. did some trenching on its RG claims (128) looking for asbestos

Tungsten

Watson Lake Mining District

Union Carbide conducted EM and magnetometer surveys and detailed geological mapping over the SUSAN property (122) west of the Cantung Road and in addition two diamond-drill holes were collared. Mineralization consists of pyrrhotite-rich skarn with very minor pyrite, sphalerite, scheelite and rare galena.

Barite

Mayo Mining District

Yukon Barite Company conducted detailed geological mapping and stripped about 10 000 metric tons of barite from the TEA claims (116) south of MacMillan Pass on the Canol Road. A 12.5 km one-lane, truck-haul road with turnouts was completed to the property from Mile 253.6 on the Canol Road.

Baroid of Canada carried out detailed geological mapping, further rock sampling and metallurgical work on material from the claims in the Hess River area, CATHY, KAM, CHAS, etc. (116). Stratabound beds of barite occur in shale of the Besa River Formation.

Jade

Watson Lake Mining District

Arctic Jade Ltd. did geological mapping and a few hundred metres of short hole diamond drilling on the KING-ARCTIC property (129) 5 km west of the Robert Campbell Highway and 120 km north of Watson Lake. A series of jade lenses occurs within metasediments

The Town Centre, built by the Northwest Territories Government, houses the nursing station, RCMP headquarters, a school, daycare centre, the fire hall, the co-op store and territorial government offices



Northern Non-Renewable Resources Branch

Mining Division

Responsibilities

This division is responsible for the administration of mining and mineral rights (excluding oil and gas) from the time a claim is acquired to the production stage, including safety in mines. The division comprises three sections — Mining Lands, Mining Geology and Mining Engineering. The responsibility for these operations rests with the Chief, Mining Division.

Department of Indian and Northern Affairs

Minister: J. Hugh Faulkner, Ottawa, Ontario
Deputy Minister: A. Kroeger, Ottawa, Ontario
Assistant Deputy Minister:
E. Cotterill, Ottawa, Ontario

Northern Non-Renewable Resources Branch

Director: H. W. Woodward, Ottawa, Ontario
Regional Director (Y.T.):
B. J. Trevor, Whitehorse, Y.T.
Regional Director (N.W.T.):
R. W. Hornal
Yellowknife, N.W.T.
Assistant Regional Director, Non-Renewable Resources, Yukon
R. R. McLeod, Whitehorse
Assistant Regional Director, Non-Renewable Resources, Northwest:
M. J. Morison, Yellowknife

Mining Division

Chief: J. M. Patterson, Ottawa, Ontario

Mining Lands Section

Head: T. W. Dent, Ottawa, Ontario
Assistant Head:
(Yukon) vacant
(N.W.T.) P. M. Corriqan, Ottawa, Ontario

Supervising Mining Recorders:

B. R. Baxter, Whitehorse, Y.T.
R. L. Williams, Yellowknife, N.W.T.

Mining Recorders:

B. E. Sias, Whitehorse, Y.T.
O. C. Paton, Dawson, Y.T.
R. G. Ronaqhan, Mayo, Y.T.
V. W. Johanson, Watson Lake, Y.T.
E. D. Cook, Yellowknife, N.W.T.
J. G. Black, Yellowknife, N.W.T.

Mining Engineering Section Yukon

Regional Mining Engineer:
N. G. Needham, Whitehorse, Y.T. (retired 1977)
District Mining Engineer:
T. Csizmazia, Whitehorse, Y.T.

Electrical-Mechanical Engineer: Vacant
Mine Rescue Superintendent:
J. D. Barraclough, Whitehorse, Y.T.
Claims Inspector: G. W. Gilbert, Whitehorse, Y.T.
Environment Technician: W. Wong, Whitehorse, Y.T.

Northwest Territories

Regional Mining Engineer: M. L. Brown
District Mining Engineer:
E. Bengts, Yellowknife, N.W.T.
Environmental Control Engineer:
A. Patrick, Yellowknife, N.W.T.
Mine Rescue Superintendent:
N. Boss, Yellowknife, N.W.T.
Claims Inspector: D. Cormier, Yellowknife, N.W.T.

Mining Geology Section

Head: A. D. Oliver, Ottawa, Ontario
Evaluation Geologist: T. W. Caine, Ottawa, Ontario

Yukon

Regional Geologist: D. B. Craig
Project Geologist: W. D. Sinclair (succeeded by
M. Marchand in 1977)
District Geologist: J. A. Morin
Staff Geologist: Vacant

Northwest Territories

Regional Geologist: W. A. Padgham
Project Geologist: A. Bau

Keewatin District Geologist: P. J. Laporte
Arctic Islands and Western Churchill Province District Geologist: W. A. Gibbins
Mackenzie District Geologist: J. M. B. Seaton
Nahanni District Geologist: C. C. Lord
Staff Geologist: E. Hurdle

Mining Lands Section

For administrative purposes, the territories have been divided into seven mining districts. A mining recording staff is responsible for the disposition of mineral rights within each district in accordance with the applicable legislation. For each territory, there is a Supervising Mining Recorder whose principal function is to ensure that uniform practices are observed in the administration of the various mining acts and regulations.

The districts and location of Mining Recorders Offices are as follows:

	District	Office
<i>Yukon Territory</i>	Dawson	Dawson, Y.T.
	Mayo	Mayo, Y.T.
	Watson Lake	Watson Lake, Y.T.
	Whitehorse	Whitehorse, Y.T.
<i>Northwest Territories</i>	Mackenzie	Yellowknife, N.W.T.
	Nahanni	Yellowknife, N.W.T.
	Arctic and Hudson Bay	Yellowknife, N.W.T.

Mineral claims staked and recorded in the Yukon Territory and Northwest Territories during the year, with comparative figures for 1975 are tabulated below:

Yukon Territory

District	Claims Recorded	
	1975	1976
Whitehorse	3,462	2,329
Dawson	1,666	2,681
Mayo	1,609	4,480
Watson Lake	1,803	2,490
Total	8,540	11,980

Northwest Territories

District	Claims Recorded	
	1975	1976
Mackenzie	10 370	11 471
Arctic and Hudson Bay	5 315	7 917
Nahanni	5 364	350
Total	21 049	19 738

Mining Engineering Section

This section is responsible for advice regarding the Mining Safety Ordinances and Mining Safety Rules and Regulations in mines as well as the Blasting Ordinance and Regulations in the Yukon and the Explosives Use Ordinance in the Northwest Territories and for amendments and the preparation of new safety legislation when required.

A Regional Mining Engineer is stationed at Whitehorse in the Yukon and at Yellowknife in the Northwest Territories. He is the senior mining engineer with a staff which includes a District Engineer, Electrical-Mechanical Engineer, Environmental Engineer, Mine Rescue Superintendent, Claim Inspector and clerical staff who are responsible for:

- inspection of mines, quarries and blasting operations to ensure compliance with safety legislation;
- inspection of mineral claims to ensure compliance with the Yukon Quartz Mining Act, the Yukon Placer Mining Act and the Northwest Territories Canada Mining Regulations;
- ensuring that sufficient mine personnel are trained in mine rescue, recovery operations and first aid;
- conducting ventilation and dust surveys, monitoring radioactive contamination, and carrying out environmental studies of all underground and surface, mining properties.

Mine Rescue

Central Mine Rescue Stations are maintained at Whitehorse, Yukon, and Yellowknife, Northwest Territories. Substations are established at each mine. The Department now owns 101 Drager GB-174 four-hour breathing apparatus. It is the policy of the Department to have a minimum of 12 Drager units at each mine so that the mine rescue team can begin a rescue operation before the arrival of trained personnel from the central station.

Nanisivik Mine employs Inuit from Arctic Bay and other communities, providing an alternative to traditional fishing, hunting and trapping pursuits.



Mine rescue teams from both Territories compete in the Canadian Mine Rescue Championship each year. In 1975 the competition was sponsored by Alberta and held in Calgary in June. Six teams competed from British Columbia, Alberta, Yukon, Northwest Territories and Nova Scotia. The Cominco team from the Con-Rycon Mine, Yellowknife, won the competition.

Mining Safety Statistics Yukon and Northwest Territories

The USA Standard Method of Recording and Measuring Work Injury Experience is used in the mining industry in the North. In accidents resulting in death, permanent total disability or permanent partial disability in the Territories, the number of days recorded as lost time conforms with the time charges set down in the American Standard.

Disabling injuries are defined by the USA Standard as being those which result in death, permanent total disability, permanent partial disability, or temporary total disability.

Days recorded as lost time do not include the day of the accident or the day of return to work.

Accident frequency is expressed as the number of accidents per one million man-hours worked.

Accident severity is expressed as the number of days lost due to accidents per million man-hours worked.

Accident Statistics — 1976

In 1976 there were 31 disabling injuries reported in the Yukon Territory. The accident frequency for disabling injuries decreased from 24.97 in 1975 to 13.93 in 1976. There was also a decrease in the accident severity rate from 2,902 in 1975 to 471 in 1976. "fall of persons" and "strain while lifting" was the chief cause of accidents in 1976 followed by "caught between two objects" and "miscellaneous causes". These three main causes accounted for 68 per cent of all reported accidents. No fatal mining accidents occurred in the Yukon Territory in 1976.

In the Northwest Territories, 121 disabling injuries were reported in 1976. The accident frequency rate increased from 22.85 in 1975 to 36.43 in 1976 and the severity rate increased from 2,460 to 13,319. "Fall of persons" was the main cause of accidents in the Northwest Territories accounting for 26 per cent of all accidents. This was followed by "caught between two objects", "struck by moving object" and "strain while lifting". These four main causes accounted for 65 per cent of all accidents reported. Seven fatal accidents occurred in the Northwest Territories in 1976.

Mining Geology Section

This section provides a geological information and advisory service to the mineral industry in the northern Territories. Regional Geologists' offices are maintained at Whitehorse, Yukon, and Yellowknife, Northwest Territories. Two core libraries, the H.S. Bostock, library at Whitehorse and the C.S. Lord library at Yellowknife, provide means for preserving valuable diamond-drill core data for the mineral industry. Each has laboratory facilities for core splitting, diamond-saw cutting, thin-section preparation and core storage.

In co-operation with the Geological Survey of Canada, the Yukon Chamber of Mines and the Northwest Territories Chamber of Mines; geoscience forums were held in the fall of 1976 at Whitehorse and Yellowknife. Well attended by the mining and exploration communities, these meetings are held on an annual basis.

Regional and District Geologists carry out mineral property examinations, collect rocks and mineral specimens and advise the mineral industry, government departments and research scientists on geological problems arising from their work in the Territories. The service includes carrying out geological evaluations on mining developments in the Yukon and Northwest Territories whenever government assistance is requested.

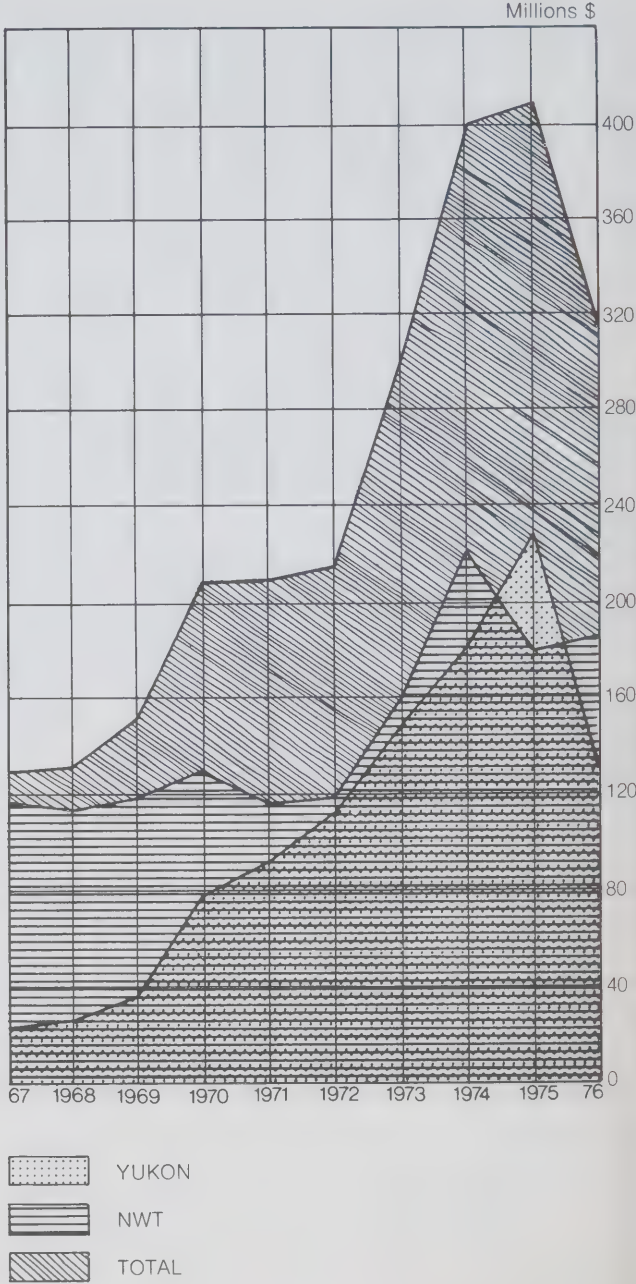
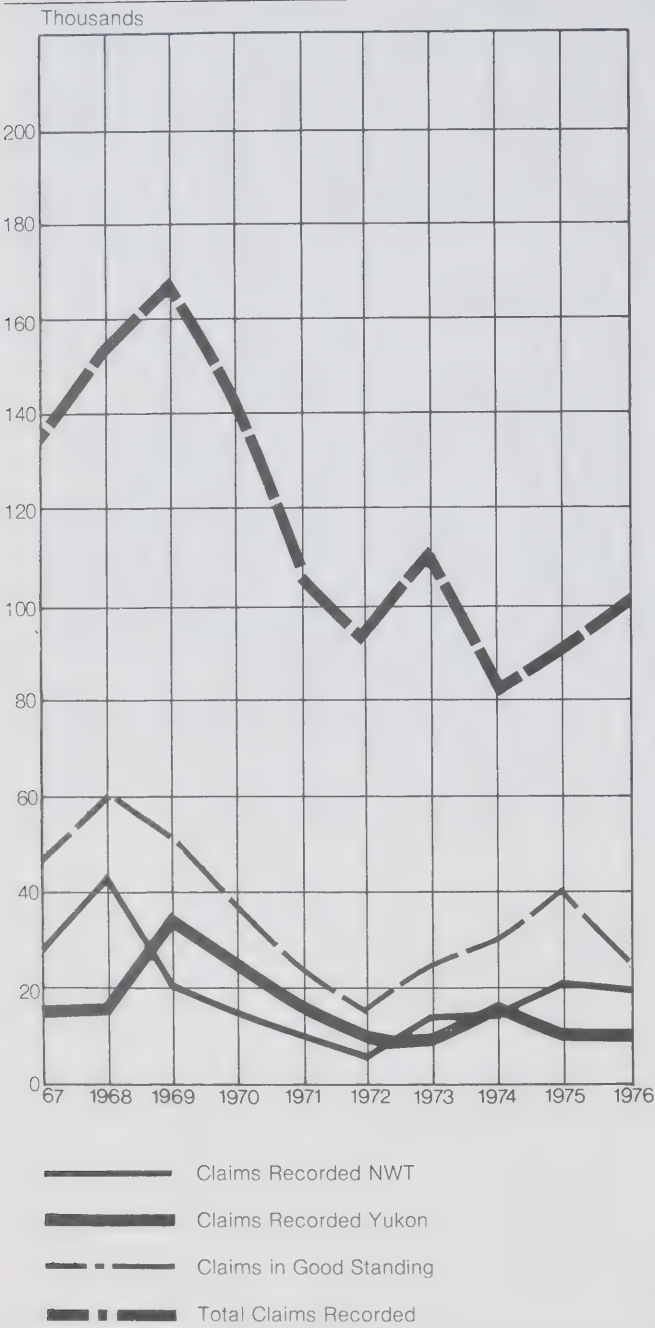
Department geologists assist prospectors and other geologists in identifying rock and mineral specimens by giving prospector training courses, in preparing geological compilation maps on mineralized areas, and giving direction when requested.

The plant at Nanisivik Mine on Strathcona Sound, Baffin Island,
N.W.T.



Mineral Claims Recorded

Value of Production



Mineral Production Chart
1967-1976

Northwest Territories

Mineral	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976(a)	Cumulative Totals (b)
Gold	\$ 14,354,472 g 11 828 777	12 381 240 10 957 941	12 381 240 10 217 554	12 188 776 10 352 606	10 897 934 9 590 415	17 713 250 9 563 666	24,262,894 7 747 098	38,651,414 5 737 565	38,734,527 5 460 651	23 120 000 5 847 000	101 843 700
Silver	\$ 8,420,714 g 61 591 976	3 940 888 116 686 653	3 940 888 63 027 059	5 114 587 85 989 978	4 574 616 91 209 266	6 778 965 126 257 130	13,691,789 168 591 544	17,869,851 118 728 409	8,883,365 61 319 188	14,885,000 108 084 000	334 883 743
Copper	\$ 538 077 kg 513 070	833,169 785 695	643,761 567 772	766,578 598 970	727,595 625 060	577,416 514 268	1,106,319 786 610	840 719 491 923	526 889 374 885	660 000 437 000	8 661 879
Nickel	\$ kg										12 850 205
Lead	\$ 1,646,816 kg 115 554 389	554,656 684 113 522 912	32 299 014 96 576 048	37 842 405 108 502 061	22 629 795 76 034 832	27 838 277 81 846 169	30,061,787 90 667 291	34,932,761 76 524 844	37,254,232 83 390 558	26,868,632 53 678 000	577 437 358
Zinc	\$ 60 852 900 kg 190 492 829	57 504,129 184 988 894	68 275 481 203 343 645	76 004,563 216 416 132	75 056,384 203 496 733	64,792,006 154 103 925	87 541 226 164 449 732	132 251 480 171 886 138	106 650 304 129 002 037	119 685 000 144 306 000	705 742 307
Uranium(d)	\$ kg										79 477 897
Cadmium	\$ 2,551,920 kg 413 404	774 060 123 196	675,136 86 999	737 632 93 984	301 476 70 488	205,436 36 832	61,152 7 620		1 027 137		8 751 846
Bismuth	\$ kg			3,072 222	41,149 3 437						44 221
Tungsten	\$ kg										
Total	\$ 111,964,162 kg 111,964,162	114,711,146 114 186 500	118,186,500 114 278 049	132,637,613 117 805 350	149,159,593 114 278 049	143,975,757 117 805 350	146,468,167 158 305 167	161,700,896 114 348 896	147,731,944 158 305 167	216,815,454 158 305 167	1,555,585,300

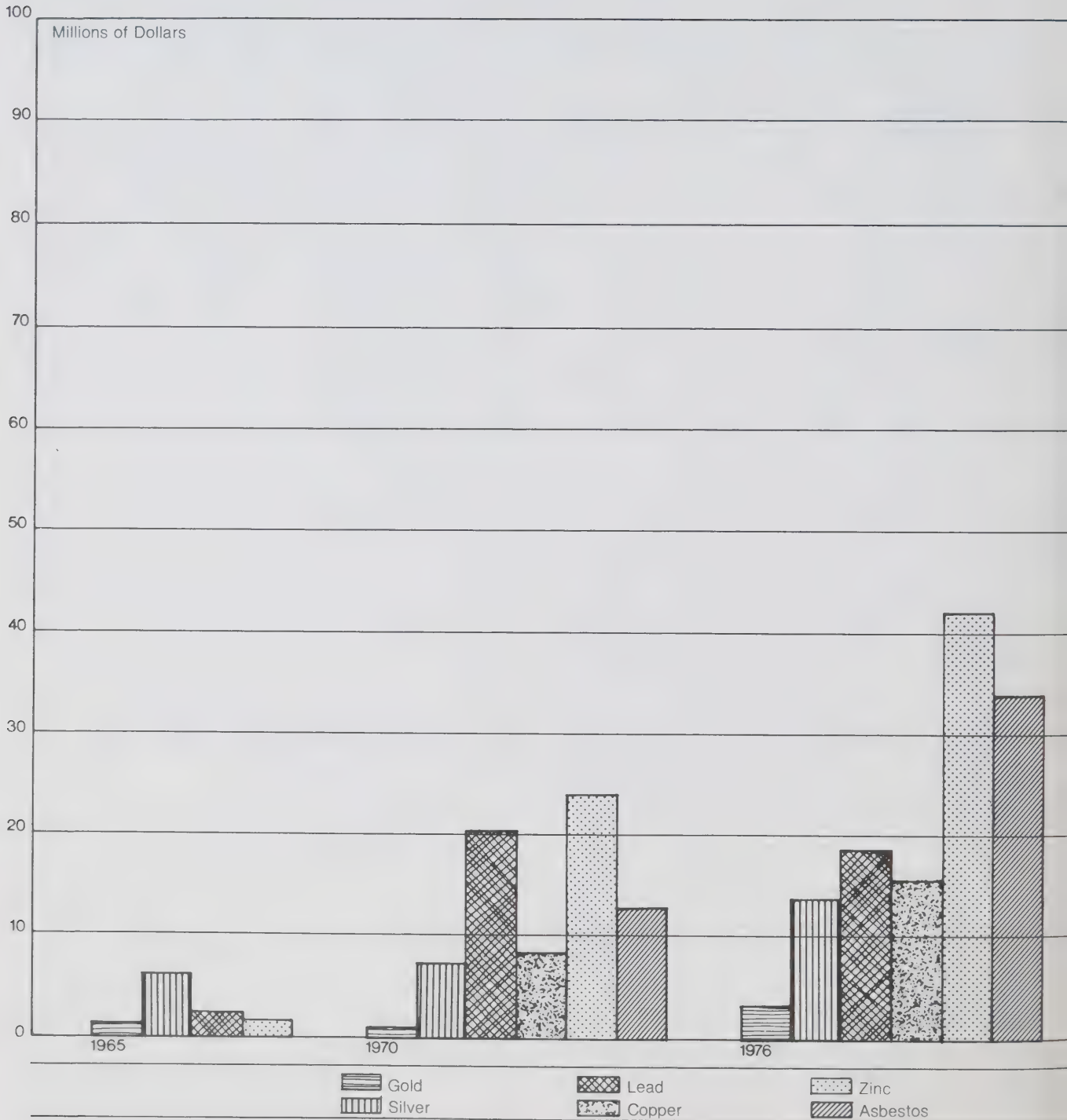
Yukon Territory

Mineral	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976(a)	Cumulative Totals (b)
Gold	\$ 675,725 g 120 350 984	911 338 4 806 384	1,118,715 5,182,166	653,034 7,845,312	511,534 8,966,417	234 983 8,331,575	2,032,502 15,342,856	4,111,631 26,800,905	5,255,077 28,531,397	3,910,000 13,446,000	276 672 563
Silver	\$ 6,701,756 kg 6 939 831	4 806 384 3 275 817	5,182,166 12 726 251	7,845,312 59 724 512	8,966,417 98 582 016	8,331,575 101 115 601	15,342,856 106 831 187	26,800,905 41,734,630	28,531,397 90 242 227	13,446,000 19,704,000	204 621 392
Lead	\$ 6,939,831 kg 6 939 831	3 275 817 3 275 817	12 726 251 12 726 251	59 724 512 59 724 512	98 582 016 98 582 016	101 115 601 101 115 601	106 831 187 106 831 187	41,734,630 41,734,630	90 242 227 90 242 227	122 863 633 122 863 633	38 213 324
Copper	\$ 3,409,779 kg 3 251 313	5 097,157 4 806 718	7 645,623 6 743 140	9,148,995 7 148 616	2,709,696 2 327 836	890 286 792 922	14,791,665 10 517 104	15,571,426 9 111 183	11,928,559 8 487 245	16,639,000 11 038 000	62 714 969
Coal	\$ 15,791 tonnes 1 735		5 478	9 896	19 074	16 724	17 782	15 447	23 326	9 049	2 567 132
Zinc	\$ 1,373,151 kg 4 298 489	748 206 2 406 956	5,035,385 14 996 798	24 845,216 70 744 510	39,003,342 105 747 869	45,241,287 107 603 704	61,167,027 114 904 734	60,899,995 79 151 212	95,400,540 115 394 553	42 898 000 51 722 000	270 919 416
Cadmium	\$ 265,997 kg 43 091	147 716 23 510	239,965 30 922	261,528 33 322	114,654 26 807	82,759 14 837	45,718 5 697	17 331 1 977	15,423 2 050	12,000 2 268	6 365 989
Asbestos	\$ 406 371 tonnes 2 050	8 684 371 57 690	11 924 526 79 321	13,927,652 95 833	12,374,380 83 433	13,006,476 92 431	13,915,140 91 384	22 752,400 82 459	32 820 720 103 735	34 460 000 102 000	97 841 790
Nickel	\$ kg										9 206 383
Platinum	\$ g										475 031
Total	\$ kg										

(a) Preliminary Figures (b) Cumulative Totals — 1932 to December 31, 1976 (c) Cumulative Totals — 1886 to December 31, 1976 (d) Figures for years 1932, 1943 to 1953 not available

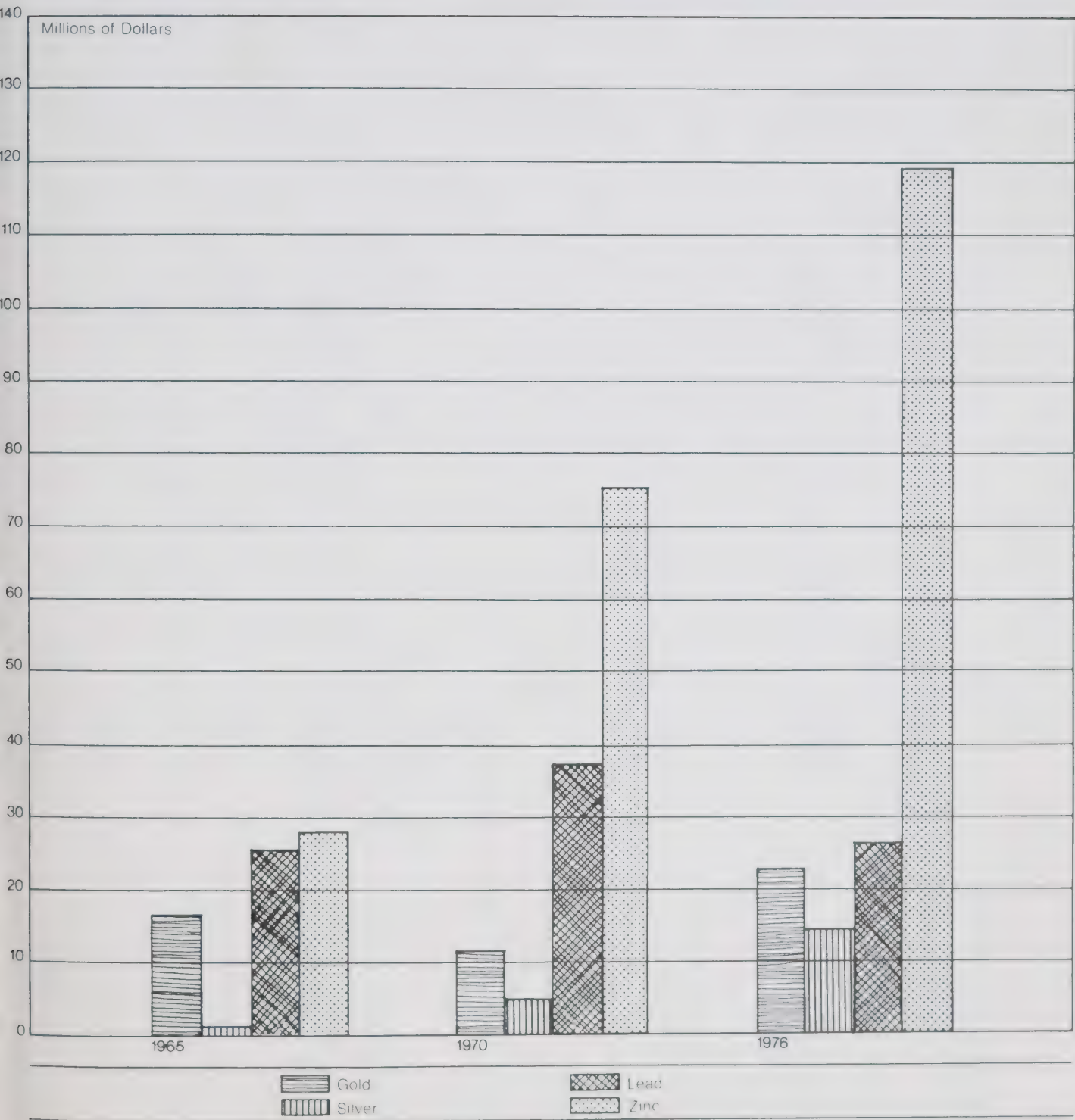
Value of Mineral Production

Yukon Territory



Value of Mineral Production

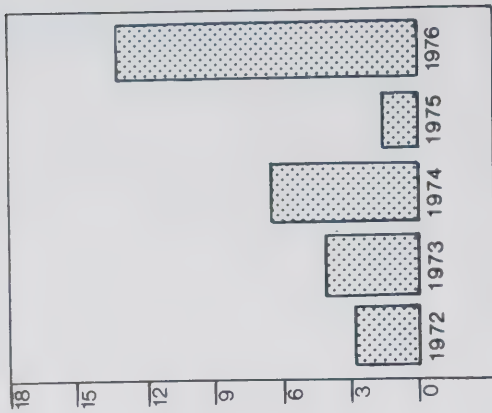
Northwest Territories



Mining Accident Severities

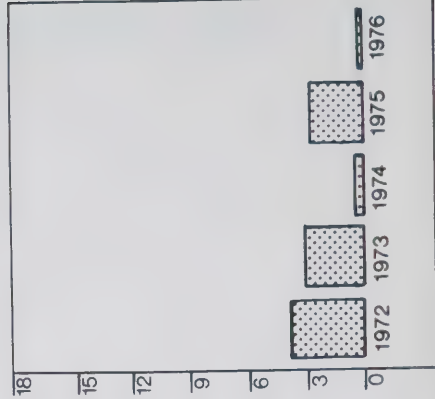
Northwest Territories

Mine	Number of Man/Hrs. Worked 1976	Number of days lost Jan-Dec. 1976	Accident Severity Jan-Dec. 1976	Accident Severity Jan-Dec. 1975
Canada Tungsten Mining Corp. Ltd.	342,168	6,366	18,605	870
Con-Rycon-Vol	432,615	175	405	2,275
Echo Bay Mines Ltd.	306,944	6,398	20,844	22,534
Giant Yellowknife Mines Ltd.	671,522	689	1,026	600
Pine Point Mines Ltd.	1,345,229	24,237	18,017	151
Terra Mining and Exploration Ltd.	222,859	6,371	28,588	468
Total	3,321,337	44,236	13,319	2,460



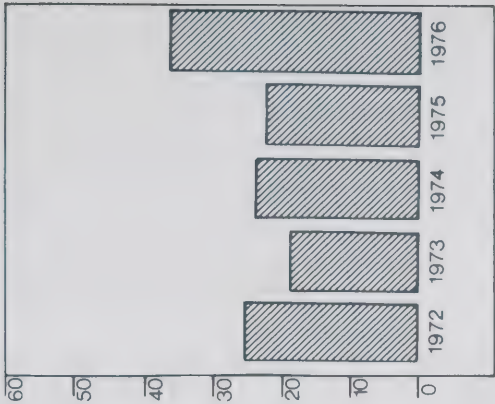
Yukon Territory

Mine	Number of Man/Hrs. Worked 1976	Number of Days lost Jan-Dec. 1976	Accident Severity Jan-Dec. 1976	Accident Severity Jan-Dec. 1975
Anvil Mining Corp.	622,324	22	35	422
Cassiar Asbestos Corp.	679,629	516	759	304
Whitehorse Copper Mines Ltd.	378,385	145	383	14,754
United Keno Hill Mines Ltd.	519,385	359	691	1,898
Tantalus Butte Coal Co.	22,074	5	227	1,281
Total	2,222,717	1,047	471	2,902

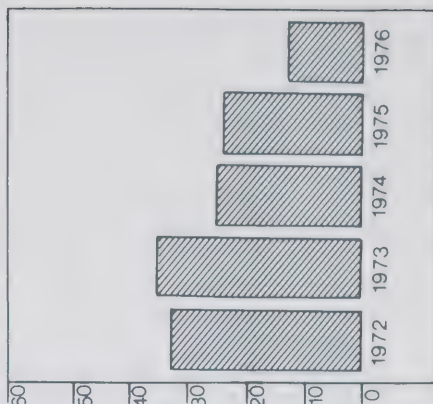


Mining Accident Frequencies

Northwest Territories				
Mine	Number of Man/Hrs. Worked 1976	Number of Accidents Jan-Dec. 1976	Accident Frequency Jan-Dec. 1976	Accident Frequency Jan-Dec. 1975
Canada Tungsten Mining Corp. Ltd.	342,168	11	32.14	27.11
Con-Rycon-Vol	432,615	14	32.36	28.39
Echo Bay Mines Ltd.	306,944	33	107.51	103.50
Giant Yellowknife Mines Ltd.	671,522	19	28.29	13.71
Pine Point Mines Ltd.	1,345,229	11	8.17	3.06
Terra Mining and Exploration Ltd	222,859	33	148.07	57.21
Total	3,321,337	121	36.43	22.85



Yukon Territory				
Mine	Number of Man/Hrs. Worked 1976	Number of Accidents Jan-Dec. 1976	Accident Frequency Jan-Dec. 1976	Accident Frequency Jan-Dec. 1975
Anvil Mining Corp.	622,324	5	8.03	21.78
Cassiar Asbestos Corp.	679,629	6	8.83	8.55
Whitehorse Copper Mines Ltd.	378,385	9	23.78	25.98
United Keno Hill Mines	519,305	10	19.26	46.87
Tantalus Butte Coal Co	22,074	1	45.30	35.60
Total	2,221,717	31	13.93	24.97



Causes of Disabling Injuries in Mines

	Drilling	Caught between two objects	Strain while lifting	Fall of persons	Struck by moving object	Foreign matter in eyes.	Tramming cars	Gassing	Fall of rock	Falling object	Blasting	Burns and Cuts	Miscellaneous	Total
Northwest Territories														
Canada Tungsten Mining Corp. Ltd.		2	1	3	1			1				1	2	11
Con-Rycon-Vol		1	1	1	3	2				2			4	14
Echo Bay Mines Ltd.		12	3	5	3	1			3	1		2	3	33
Giant Yellowknife Ltd.		1	6	5	2			1	2	1			1	19
Pine Point Mines Ltd.				7	1					1		2		11
Terra Mining and Exploration Ltd.		3	2	10	6	5			3	2		2		33
Total		19	13	31	16	8		2	8	7		7	10	121
Yukon Territory														
Anvil Mining Corp.		1	1		1							1	1	5
Cassiar Asbestos Corp.		1	1	2								1	1	6
Whitehorse Copper Mines Ltd.			2	3	1	2			1					9
United Keno Hill Mines Ltd.		3	3	3									1	10
Tantalus Butte Coal Co.			1											1
Total		5	8	8	2	2			1			2	3	31

Appendix 1

List of publications

Exploration and geological service D.I.N.A.

Books

Mineral Industry Report, 1969-70, Vol. 1, Yukon Territory and Southwestern Sector, District of Mackenzie; by D.B. Craig and P.J. Laporte, EGS 1972-1. \$2.00.

Mineral Industry Report, 1969-70, Vol. 2, Northwest Territories east of 104° west longitude; by P.J. Laporte, EGS 1974-1. \$2.00.

Mineral Industry Report, 1971-72, Vol. 1, Yukon Territory; by D.B. Craig and M.W. Milner, EGS 1975-6 \$3.00.

Mineral Industry Report, 1971-72, Vol. 2, Northwest Territories east of 104° west longitude; by P.J. Laporte, EGS 1974-2. \$2.50.

Mineral Industry Report, 1971-72, Vol. 3, Northwest Territories west of 104° west longitude; by W.A. Padgham, M.W. Kennedy, C.W. Jefferson, D.R. Hughes and J.D. Murphy, EGS 1975-8. \$3.00.

Mineral Industry Report, 1973, Yukon Territory; by W.D. Sinclair and G.W. Gilbert, EGS 1975-7. \$3.00.

Mineral Industry Report, 1974, Yukon Territory; by W.D. Sinclair, J.M. Maloney and D.B. Craig, EGS 1975-9. \$3.50.

Lake-Sediment geochemical sampling survey in the following areas: Yellowknife, Indin Lake and portion of the Cameron River and Beaulieu River Greenstone Belts; by D. Nickerson, G.S.C. Open File 129, 1972. \$12.00.

Maps

Preliminary geology map of Camsell River Silver District, scale five inches to one mile; by R.J. Shegelski and J.D. Murphy, G.S.C. Open File 135, 1973. \$3.50.

Preliminary geology map of Rainy Lake, N.W.T. 86E/9, scale 1:31,680; by J.D. Murphy, G.S.C. Open File 135, 1973. \$1.00.

Preliminary geology map of Rankin Inlet, 55K/16, scale 1:31,680; by P.J. Laporte and S.K. Frape, G.S.C. Open File 179, 1973. \$1.00.

Preliminary geology map of White Eagle Falls, N.W.T., 86F/12, scale 1:31,680; by W.A. Padgham, G.S.C. Open File 199, 1974. \$1.00.

Preliminary geology map of High Lake, N.W.T., 76M/7, scale 1:31,680; by W.A. Padgham, G.S.C. Open File 208, 1974. \$1.00.

Geology of Two Base-Metal Deposits (High Lake and Indian Mountain deposits) in the Slave Structural Province; by W. Johnson, 1974, \$4.00.

Preliminary geology maps of Hackett River area, N.W.T., scale 1:31,680; by W.A. Padgham, C.W. Jefferson, E.A. Ronayne, V.Z. Sterenberg and D. Bryan. \$2.00 per map.

EGS 1975-1; 76-G-13
EGS 1975-2; 76-G-12
EGS 1975-3; 76-G-5
EGS 1975-4; 76-F-9 succeeded by EGS 1976-6
EGS 1975-5; 76-F-16 succeeded by EGS 1976-8

Preliminary geology maps of various areas of the N.W.T. scale 1:31,680. \$2.00 per map.

EGS 1976-1; 65-H-16
EGS 1976-2; 65-I-15
EGS 1976-3; Parts of 56-D-2 and 7 (MK Project)
EGS 1976-4; 76-K-2
EGS 1976-5; 76-K-1
EGS 1976-6; 76-F-9
EGS 1976-7; 76-F-15
EGS 1976-8; 76-F-16

Papers

Copies of the following papers are available at the Regional Geologists' Offices or in Ottawa.

A Critical Review of Northern Mineral Potential; by D.B. Craig and J.A. Kelly. Paper presented at the prospectors' and Developers' Association Convention, Toronto, Ontario, 1970.

Mineral Exploration North of 60°, Trends and Achievements; by R.W. Hornal and D.B. Craig. Paper presented at the Prospectors' and Developers' Association Convention, Toronto, Ontario, 1971.

Northern Canada Mineral Exploration 1972; by P.J. Laporte, W.A. Padgham and D.B. Craig. Paper presented at the Prospectors' and Developers' Association Convention, Toronto, Ontario, 1973.

Abstracts of the N.W.T. Chamber of Mines Exploration Symposium; by Exploration and Geological Services, Yellowknife, N.W.T., February, 1972.

A Review of Mineral Exploration in the Keewatin District, Northwest Territories; by P.J. Laporte, 1972. Presented at the Northwest Territories Chamber of Mines Exploration Symposium, Yellowknife, N.W.T., February, 1972.

Highlights of Mining Exploration in Northern Canada for 1973; by R.W. Hornal and D.B. Craig. Paper presented at the Prospectors' and Developers' Association Convention, Toronto, Ontario, 1974.

Exploration for Lead-Zinc in the Selwyn and Mackenzie Mountains, Yukon and Northwest Territories; by J.D. Murphy and W.D. Sinclair. Paper presented at the Prospectors' and Developers' Association Convention, Toronto, Ontario, 1974.

Mineral Potential of the Northwest Territories; by W.A. Padgham. Published in the *Geology of Canadian Arctic*; Editors: J.D. Aitken, D.J. Glass. Special publication of the C.S.P.G. and G.A.C., 1974.

Potential for Large Tonnage Mineral Deposits in a Selected Area (65° to 74°N, 80° to 120°W) of the Northwest Territories; by J.M. Seaton. Paper presented to CIM western meeting, Winnipeg, Manitoba, 1974.

Lead-Zinc Mineralization in the Central Dolomite Belt of the Lower Cambrian Sekwi Formation; by W.J. Crawford. Paper presented at Geoscience Forum, Yellowknife, N.W.T., 1974.

Lake Sediment Geochemistry as a Guide to Detection of Massive Sulphide Deposits in the Southern Slave Province; by R.G. Jackson and I. Nichol. Paper presented at Geoscience Forum, Yellowknife, N.W.T., 1974.

Summary of Exploration Activity, Mackenzie Mountains, 1975; by C.C. Lord. Paper presented at the Geoscience Forum, Yellowknife, N.W.T., 1975.

Mineral Exploration in Southern Yukon, 1975; by W.D. Sinclair. Paper presented at the Geoscience Forum, Whitehorse, Yukon, 1975.

Activity Reports

Mines and Mineral Statistics, North of 60 (published monthly and includes claim staking and production statistics for Yukon and N.W.T.).

Mines and Minerals Activities, North of 60 (published yearly and includes summaries of exploration and mining activities for Yukon and N.W.T.).

Indexes

(produced by Canadian Centre for Geoscience Data for D.I.A.N.D.) *Index of Mineral Claim Assessment Work Reports* by National Topographic System on file in Ottawa, Yellowknife and Whitehorse.

Index of Assessment Work by Concept on file in Ottawa, Yellowknife and Whitehorse.

Index of Geological Reports and Maps by National Topographic System of the Yukon and Northwest Territories. Includes work on file by: Mining and Oil & Gas, D.I.A.N.D.; E.M.R.; and other agencies.

Preliminary Studies

The following preliminary reports are on open file at Ottawa and at the Regional Geologists' Offices in Yellowknife, N.W.T. and Whitehorse, Y.T.

- 1) Preliminary Study on Metal Dispersion Patterns in Lake Sediments and the relationship to mineralization in the Yellowknife and Indian Lake areas; by R.G. Jackson, Exploration Geochemistry Group, Department of Geological Sciences, Queen's University, 1973.
- 2) Study of Coal in the Yukon; by D.B. Craig and M.J. Milner, 1973.
- 3) Coal Deposits in the Arctic Archipelago, N.W.T.; by T.W. Caine, 1973.
- 4) Soapstone Deposits of the N.W.T.; by J.D. Murphy, 1973.
- 5) Mineral Occurrence Overlays for geological maps in the western District of Mackenzie, NTS 75, 76, 85, 86, parts of 77, 87, 95, 96 and 105.

Papers in Preparation

- 1) Mineral Industry Report, 1969-70, Vol. 3, Northwest Territories west of 104° west longitude.
- 2) Mineral Industry Report, 1975, Northwest Territories.
- 3) Mineral Industry Report, 1976, Northwest Territories.
- 4) Mineral Industry Report, 1977, Northwest Territories.
- 5) Mineral Industry Report, 1977, Yukon Territory.

Preliminary copies of the following can be examined at the Regional Geologist's office, Yellowknife.

- 6) Geology compilation of Beniah Lake, 85-P-8.



Indian and
Northern Affairs

Affaires Indiennes
et du Nord

North of 60

Mines and Minerals
Activities 1977

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461
1435

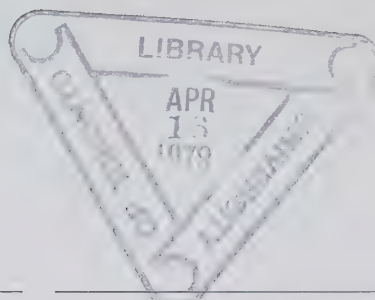


North of 60

Mines and Minerals
Activities 1977

Government
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Introduction

Exploration Summary

In spite of continued reductions in precious metal exploration, expenditure on the search for minerals in the Northwest Territories was at about the same level as in 1976. Pronounced increases in uranium exploration took up the slack developed elsewhere. Little success has been reported in the uranium search on Baffin Island, around Bathurst Inlet, in the East Arm–Nonacho Lake area (in and southeast of Great Slave), or in the southern part of the Great Bear Batholith in the Western Bear Province, but a number of uranium prospects have been located in the Keewatin, in the Dismal Lakes area of the Coppermine, and in the northern part of the Great Bear Batholith.

Base metal exploration was still active in many of the Slave Province volcanic belts but major expenditures were concentrated in drill projects around Pine Point, on the Gayna River, and along the copper belt in the Mackenzie Mountains.

Precious metal exploration was confined mainly to the silver district on Great Bear Lake and to gold deposits around Yellowknife. On the Camsell River, Northrim Mines resumed development on the Silver Bay Mine, and in the Beaulieu River area Strike Lake Resources commenced small scale production from high grade gold quartz veins on the Joon Claims.

During 1977 some \$16–\$18 million was spent on mineral exploration in the Yukon Territory, about the same as in 1976.

The areas of greatest interest were the Anvil Belt where new discoveries stimulated even further interest in the zinc-lead search, the Pelly Mountains where the volcanogenic base metal occurrences are showing promise, MacMillan Pass for TOM type deposits and the Wernecke Mountains where both zinc-lead deposits and uranium bearing breccias were actively explored. The majority of claims were staked for zinc-lead prospects.

Copper exploration was down from previous years and uranium exploration began to become important.

Mine Rescue North of 60

Steve Homulos, mine inspection engineer in the Northwest Territories and then Head of Mining Engineering until his retirement from Indian and Northern Affairs in 1976.

By Steve Homulos

Mine rescue procedures and equipment are vital anywhere, but more so in the remoteness of the Yukon and Northwest Territories where operations are widely scattered and the climate quite capable of disrupting communications.

The most important aspect of a mine rescue program is the training of miners to work under oxygen in a hostile atmosphere so that they can rescue survivors of mine explosions, fires or other disasters. In cases of such explosions and fires, the atmosphere in a mine is usually deficient in oxygen and contains high quantities of carbon monoxide or toxic gases. Rescuers, therefore, wear highly-specialized, self-contained, oxygen-breathing apparatus, or compressed air masks. They must also use sign language or some code of signals on a mission since they are forbidden, for their own safety, to communicate while wearing some of this equipment. This was particularly true with earlier versions when mouth pieces and nose clips were used. Today's equipment has face masks with speaking diaphragms so that a limited amount of talking is permitted.

The first breathing apparatus was designed and built by Drager in Germany hence the name *dragermen* is still used when referring to mine rescue men, particularly so in the coal mining areas of Nova Scotia before and after the First World War. In England and the United States, the Proto and the McCaa replaced the original Drager equipment.

The Scott Air Pack and MSA Air Masks are in common use today and operate on compressed air. This type of apparatus is popular with fire departments. Still another piece of equipment was the Chemox developed during the Second World War for the navy. This employed a canister and oxygen was produced by the wearer breathing through the canister. After the war this equipment was used to some extent in mines as well as in the oil fields.

Around 1965 Drager came out with a more sophisticated piece of equipment, the BG 174, which was lighter and had a life of four hours as opposed to the two-hour life of either the Proto or the McCaa. Simultaneously, breathing apparatus using liquid oxygen, such as Aerorlox, was developed and is being used in areas where liquid oxygen is readily available. In remote regions, such as the northern territories, equipment using high-pressure oxygen is more practical since oxygen cylinders are already available at most mines for welding purposes.



A.D. (Ab) Oliver, mine inspection engineer in the Yukon and then Head of Mining Geology until 1978 when he left Indian and Northern Affairs for Labour Canada.



The first mine rescue station and formal mine rescue training were set up in Yellowknife in 1951 under my direction. Forty-eight McCaa two-hour breathing apparatus were obtained and Fred Dunn was employed as mine rescue superintendent. Training commenced immediately. Each mine rescue team consists of six men and each mine in the territory was asked to have at least two trained teams at all times. Since then many hundred miners have taken this training.

In the Yukon at that time there was only one underground mine which didn't warrant the establishment of a full mine rescue station. The station at Yellowknife was the back up for the Yukon. United Keno Hill mines, however, purchased about 20 Scott Air Packs using compressed air and having a half-hour life.

In 1958, Fred Dunn was replaced as mine rescue superintendent in the N.W.T. by Leo Comeau whom Dunn had trained at the Yellowknife station. Nolan Boss, in turn trained by Leo Comeau, took over as mine rescue superintendent in 1971.

In the Yukon a government-operated mine rescue training program began in 1961 under A.D. (Ab) Oliver, mining inspector. Scott Air Packs were used initially. The training was supplemented by regular trips to the Yukon by Leo Comeau who brought with him the McCaa two-hour breathing apparatus. This training proved itself during a mine fire in 1966 at the No Cash Mine in the Yukon. Mine Rescue men using the Scott Air Packs were able to extinguish a mine fire, restore ventilation and evacuate four miners who were trapped in the mine. Three other miners who had barricaded themselves in good air were rescued by teams from Yellowknife using the McCaa equipment. The journey from Yellowknife took five hours of flying time. Mine rescue teams from British Columbia were standing by in Vancouver to be flown in if required. Teams have been used in other disasters, one being a mud slide situation in the NWT community of Fort St. John in 1967 by Giant Yellowknife volunteers.

In 1967 a proper mine rescue station was established in Whitehorse under Ab Oliver's direction and John Barraclough, another graduate of the Yellowknife mine rescue station, was hired as mine rescue superintendent and training officer. In 1968 the McCaa two-hour breathing apparatus was replaced with the newer, more sophisticated Drager BG 174 four-hour equipment. Shortly afterwards the SR-45 (Self Rescuer), with a three-quarter-hour life, was developed. This lightweight unit was obtained both as a back-up to the BG 174 and to put on survivors when evacuating them from or through bad pockets.

At present the NWT mine rescue station has 72 BG 174s, 30 SR-45s, 36 MSA Air Masks, and testing equipment for various gases that may be found in a mine during a rescue operation. In the Yukon there are 44 BG 174s, 18 SR-45s and 14 Scott Air Packs.

Mine rescue men are very dedicated miners who devote extra time to train for a very dangerous task. They learn not only the operation and use of highly specialized breathing apparatus but also special work methods when on a rescue mission. They also train in the use of various types of test equipment, such as the Wolf safety lamp to check deficiency of oxygen, and detectors of methane or other dangerous gases that may be encountered. All mine rescuers take first aid and, of course, must pass a stringent medical examination.

The oxygen breathing apparatus is the lifeline of the mine rescue team and the rescuer must have confidence in the equipment. To maintain a valid mine rescue certificate they must practise and use the breathing apparatus at least once a month.

It is important in a mine rescue operation that laid-down, standard procedures and drills are used for the safety of the mine rescue personnel and more efficient mine rescue operations. In 1967 the Canadian Mine Rescue Association was formed to conduct interprovincial mine rescue competitions. The object of these competitions is to observe the quality of mine rescue training and to standardize it, since mine rescue teams across Canada and in parts of the United States may be called upon to work together in case of a major disaster. In a mine fire at the Sunshine Mine in Idaho, teams from British Columbia participated in the rescue work, and equipment from Yellowknife was used as well. Since miners drift from province to province it is important that training in all provinces be based on common practice and equipment.

So far the territories have hosted the national competition three times. Giant Yellowknife Mine, N.W.T., won the national hard rock competition three times, 1971-1973. The Con-Rycon Mine of Cominco Ltd., Yellowknife, won the overall trophy as well as the hard rock category in 1975.

Each territory has its own annual competition as well, the winner in each territory then going to the national event.

Northwest Territories

Mining Production

The value of mining production sales in the Northwest Territories was \$218 million (excluding tungsten, oil and natural gas), a record high. Production came from eight mines which produced zinc, lead, gold, tungsten, silver, copper and cadmium.

There were 1,753 persons employed by the producing mines in 1977 an increase of 20 persons over the 1976 figure.

Lead-zinc

Pine Point Mines Ltd.

Exploration increased the ore reserves to 34 million tonnes after allowance for the 3.1 million tonnes milled during 1977. Production came from seven open pits with one pit being closed and two new pits beginning production. The underground test mine was suspended because of poor zinc prices.

Pine Point Mines Ltd.

Type:	Open-pit and underground
Location:	South shore of Great Slave Lake, 80 km east of Hay River
Product:	Lead, zinc
Rate:	8 611 tonnes per day
Tons Milled:	3 123 307 tonnes
Reserves:	34.0 million tonnes
Reserve Grade:	2.1 per cent lead and 5.3 per cent zinc
Employees:	652

Nanisivik Mines Ltd.

The mine has now completed its first calendar year of production with the mill operating at a rate well in excess of the design capacity. Five shipments of lead-zinc concentrates left the northern Baffin Island site for Europe in the shipping season. The shipments totalled 97 812 tonnes of zinc concentrate and 13 149 tonnes of lead concentrate valued at nearly \$30 million.

Nanisivik Mines Ltd.

Type:	Underground
Location:	29 km northeast of Arctic Bay
Product:	Zinc, lead, silver, cadmium
Rate:	1 706 tonnes per day
Tons Milled:	555 966 tonnes
Reserve:	6 380 422 tonnes
Reserve Grade:	13.48 per cent zinc, 1.45 per cent lead and 60 grams silver per tonne
Employees:	158

Gold-Silver

Giant Yellowknife Mines Ltd.

A record tonnage of 407 630 tonnes was milled during 1977. The open pits contributed 41 per cent of the ore. The production of gold decreased slightly due to a lower grade of ore being processed. Exploration for additional ore is being concentrated at depth and at the north end of the property.

Giant Yellowknife Mines Ltd.

Type:	Underground and open-pit
Location:	2.4 km north of Yellowknife
Product:	Gold, silver
Rate:	1 120 tonnes per day (including ore from adjoining Supercrest and Lolor properties)
Tons Milled:	407 630 tonnes
Reserves:	910 823 tonnes
Reserve Grade:	11.66 grams gold per tonne
Employees:	335

Cominco Ltd.: Con-Rycon-Vol Mines

Exploration identified new reserves in the lower levels of the mine which is accessed by the new Robertson Shaft. A major exploration program to test the deep gold bearing structures was initiated at year end.

Cominco Ltd. (Con-Rycon-Vol)

Type:	Underground
Location:	2.4 km south of Yellowknife
Product:	Gold, silver
Rate:	390 tonnes per day
Tons Milled:	142 697 tonnes
Reserves:	1 478 726 tonnes
Reserve Grade:	19.56 grams of gold per tonne
Employees:	245

The Northwest Territories mine rescue team, here represented by a team from Great Yellowknife Mines Ltd., gets last minute instructions from the team captain before competing in the national mine rescue competition.



Silver-copper

Echo Bay Mines Ltd.

Echo Bay continued to produce ore from both the Echo Bay and Eldorado mines. Although the number of tons milled in 1977 dropped from the 35 732 tonnes milled in 1976 the silver production rose by almost 17 per cent and copper production dropped by 39 per cent.

Echo Bay Mines Ltd.

Type:	Underground
Location:	Port Radium
Product:	Silver, copper
Rate:	86 tonnes per day
Tons Milled:	31 090 tonnes
Reserves:	Not known
Reserve Grade:	Not known
Employees:	114

Terra Mining and Exploration Ltd.

Production came from the Silver Bear, North and Norex mines. Silver production was considerably below the record level established in 1976 because of delays in readying new stopes for production. Exploration confirmed depth extension of the No. 11 vein ore structure and discovered a sulphide zone to the north of the Silver Bear Mine containing uranium and silver mineralization.

Terra Mining and Exploration Ltd.

Type:	Underground
Location:	16 km south of Great Bear Lake
Product:	Silver, copper, bismuth
Rate:	92 tonnes per day
Tons Milled:	33 530 tonnes
Reserves:	24 989 tonnes
Reserve Grade:	1 156 grams silver per tonne
Employees:	63

Northrim Mines Ltd.

Exploration in the mine located a new silver-bearing vein system with good silver values. A considerable amount of time has been spent on developing the underground workings and improving mill and camp facilities.

Northrim Mines Ltd.

Type:	Underground
Location:	9 km east of Terra
Product:	Silver, copper, bismuth
Rate:	18 tonnes per day
Tons Milled:	3 404 tonnes
Reserves:	Not known
Reserve Grade:	Not known
Employees:	14

Tungsten

Canada Tungsten Mining Corp. Ltd.

Canada Tungsten produced record levels of tungsten concentrate during the year by milling a larger tonnage of a slightly better grade and improving the recovery over former years. The company commenced an expansion program to double the capacity of the mill to 1,000 tons (907 tonnes) of ore a day.

Canada Tungsten Mining Corp. Ltd.

Type:	Underground
Location:	Tungsten, N.W.T.
Product:	Tungsten
Rate:	387 tonnes per day
Tons Milled:	168 402 tonnes
Reserves:	3 810 215 tonnes
Reserve Grade:	1.55 per cent tungsten trioxide
Employees:	172

Mineral Exploration

For the third year in a row mining exploration expenditures were estimated to be approximately \$25 million. Major expenditures were made on widespread uranium exploration programs and on base metal exploration in the Slave Province, Pine Point area and the Cordillera. Precious metal exploration was confined mainly to the silver district on Great Bear Lake and to gold deposits near Yellowknife.

The number of claims staked increased from 19,738 in 1976 to 21,856 in 1977, an increase of almost 11 per cent. This is the fifth year showing an increase in claim staking. The number of claims in good standing also increased from 64,603 in 1976 to 78,149 in 1977.

Precious Metals

Low gold prices inhibited precious metal exploration in the Territories. A small mining operation began production from a small high grade deposit east of Yellowknife, and the Silver Bay Mine in the Camsell River silver district was again in operation but no shipments have been reported.

Keewatin Region

Essex Minerals Company mapped and geophysically surveyed a gold showing on the northeast shore of Turquetil Lake (4).

A small crew did geological mapping, underground drilling and bulk sampling at the Cullaton Lake camp (7) of *O'Brien Mines*.

Mackenzie Region

Slave Province

During the first nine months of 1977 *Cominco Ltd.* drilled 48,596 feet underground, mainly for exploration in the Con Mine at Yellowknife.

Geophysical Engineering Ltd. drilled the YT group five miles south of Con Mine. The claims were returned to the owners who later transferred them to Giant Yellowknife Mines Ltd.

Giant Yellowknife Mines Ltd. drilled 58,181 feet underground and 6,913 feet from surface in the Yellowknife area to the end of October 1977. This included 7,880 feet of underground exploratory drilling at the Giant Mine, 2,138 feet of surface exploratory drilling at the Supercrest property, and 4,775 feet at the Lynx Yellowknife property immediately north of the Akaitcho Mine. Most of the drilling, 53,518 feet at the Giant and 1,558 feet at the Lolar, was for ore definition.

Strike Lake Resources Ltd. recovered in excess of 100 ounces of native gold carrying some silver from a quartz stockwork within Yellowknife sediments on the JOON claims (40) near the old Beaulieu Mine.

Bear Province

Sunshine Mining Ltd. (Kellogg) Idaho drilled 9 holes totalling 2,514 feet on the LEAH claims (50), in the Camsell River silver district.

During the first nine months of 1977 *Terra Mining and Exploration Ltd.* diamond drilled 7,875 feet from the surface, 6,953 feet underground and advanced the decline 1,790 feet at the Terra Mine (50). At the Norex mine eight miles to the east a decline was advanced to explore the ore bearing structure at depth. High grade silver was reported intersected during the summer.

Northrim Mines Ltd. reopened the Silver Bay Mine (50), across the Camsell River from Norex. By June 489 feet of decline and 267 feet of drifting had been done and 480 tons had been milled, but no reports on grade of concentrates or millfeed have been provided.

Echo Bay Mines Ltd. drilled 5,122 feet on the surface and 26,347 feet underground during the first nine months of 1977. Most of the drilling was for ore definition.

Base Metals

Exploration for base metals was significantly reduced over 1976, a trend that began in 1975 and will be even more evident in 1978. In the Slave Province widespread testing of numerous volcanic belts continued although at a lower pace than last year. Elsewhere most work was concentrated near producing mines or in and around previously made discoveries.

Keewatin Region

Nineteen holes, totalling 7,000 feet, were drilled on ground held by *Aquitaine Company of Canada Limited* in the Camp Lake, Dionne Lake and McConnell River area (1).

Gulf Minerals Canada Limited did airborne and ground geophysical surveying, prospecting and diamond drilling in the Rochon Lake–Ennadai Lake area (3).

St. Joseph Exploration Limited drilled and geophysically surveyed the western extension of massive sulphide bodies at the south end of Heninga Lake (5).

Noranda Exploration Company, Limited did E.M., magnetometer and geological surveys of metavolcanics northwest of Nowyak Lake (6) and of an ultramafic flow complex west of Griffin Lake (8).

A magnetometer survey tested the MAG claims on the north shore of Chesterfield Inlet, west of the Quoich River (14).

Arctic Islands Region

Nanisivik Mines Ltd. (20) reached planned production rates at Strathcona Sound and shipped its first lead and zinc concentrates. Development of less than one tenth of the deposit suggests larger tonnages but lower grades than previously indicated. However, lead grade has been higher than expected. At present, exploration is limited to minor underground drilling.

At Hawker Creek (21), twenty-five miles southeast of Nanisivik Mine, *Shell Resources Ltd.* did geochemical, geophysical and geological surveys on property optioned from Global Arctic Resources.

On Cornwallis Island (25), *Canadian Superior Exploration Ltd.* prospected and mapped several claim blocks.

Great Slave Lowlands

Pine Point Mines Ltd. continued routine exploration on their large holdings around the Pine Point Area. Most of their 1.9 million dollar exploration expenditure was for improved IP surveys and grid drilling. Newly discovered ore was approximately equivalent to that mined during the year.

Western Mines Ltd. and *Dupont of Canada* continued drilling their Great Slave Reef property west of Buffalo River (37). The X-25 deposit is now estimated to contain 3.8 million tons of 11.9% zinc and 3.3% lead. Drilling is scheduled to resume in November.

Shell Resources Ltd.'s planned winter IP survey on claims east of Pine Point (36) was delayed pending issuance of a land use permit.

Cominco Ltd. did lake sediment near Moraine Point (38) but IP surveys were interrupted by a forest fire.

Mackenzie Region

Slave Province

William Rossing of Yellowknife continued trenching on a copper showing on the EDE claims (39) on the north shore of the East Arm of Great Slave Lake.

St. Joseph Explorations Ltd. mapped and did geophysics on claims in the Victory Lake area (41).

Noranda Exploration Company, Limited drilled four short holes and trenched showings in the Mackay-Courageous Lake Volcanic Belt (65). Noranda mapped and drilled on the BARB claims (59) just north of the James River, and did regional mapping southeast of Hope Bay (72).

Ventures West Capital Ltd. performed trenching, prospecting, geophysics and geology on the MARS claims (60) near Point Lake, on the NOSE (69) near Contwoyto Lake, and on the OX group (67) near Muskox Lake.

Texasgulf Inc. (63) used helicopter-borne E.M. to survey parts of their 86 H/1 Prospecting Permit, and parts of 86 A/16 and 76 E/4. AEM and ground reconnaissance covered a volcanic belt north of Winnedegi Lake (42).

The Izok Lake (60) deposit and nearby targets on the HAL and HIP claims (60) were tested with 2,844 feet of drilling in nine holes. At Izok Lake two holes tested the south zone, two the east end of the central zone, one the southeast zone, and two explored IP anomalies on the southwest shore of the lake.

Texasgulf drilled 1,649 feet in the Olga Lake area (61). Four holes on the TEN claims, one on the TET and one on the TAN, probed AEM anomalies.

A large core storage facility was constructed at Ham Lake near Izok Lake (60) and transportation routes to the deposit from the south and west were studied.

Giant Yellowknife Mines Ltd. returned the Acadia gold property (58) to the owners after a geophysical survey of a gossan on the P claims. Drilling on this zone in 1976 had intersected volcanogenic copper-zinc mineralization in an alteration zone.

Great Plains Development Company of Canada Ltd. (Norcen) did ground geophysics and drilled 2,193 feet in 8 holes on the BINDI, MS and CED group (59) in the James River area.

Getty Mineral Ltd. reconnoitered several small areas of volcanics southeast of Walmsley Lake (66).

Airborne E.M. and magnetometer and ground geological and geophysical surveys by *Hudson Bay Oil and Gas Ltd.* covered two areas in the Central Slave Province, one (62) northeast of Hudson Bay Oil and Gas Ltd.'s 86 H/8 permit, the other (64) to the south of 86 A/9.

Cominco Ltd. drilled 1,627 metres in 10 holes on the PALE group (68) near the south end of the Back River volcanic complex. A two man Cominco crew checked AEM anomalies located earlier in the year near Olga Lake (61).

Beàr Province

Noranda Exploration Company, Limited drilled several thousand feet on a copper-uranium deposit on the DIANNE claims (43).

Nahanni District

Nahanni Placers and Cambria Exploration (73) completed detailed soil and rock geochemical surveys and prospecting over geochemical anomalies outlined last year.

Union Carbide Canada Ltd. diamond drilled a scheelite bearing skarn in the Flat River valley northwest of Tungsten. The property was also mapped and geochemical surveys completed (74).

Canex Placer and U.S. Steel Western Hemisphere Ltd. continued to diamond drill lead-zinc mineralization in their main deposit on the XY claims (75) at Howard's Pass. Underground work is planned for next year.

Archer Cathro and Associates mapped and prospected east and north of Howard's Pass (75).

Shell Resources Ltd. continued to test the copper potential of the Redstone Formation by prospecting, geochemical surveys at Coates Lake (76) and on the Keele River (78).

Rio Canex diamond drilled copper mineralization at the contact of the Redstone and Coppercap Formations in the Hayhook Lake area (77) and mapped and prospected the RIO claims (78). Over 30,000 feet of diamond drilling on Rio Canex's RT group at Gayna River (80) outlined lead-zinc mineralization in breccias associated with Helikian stromatolitic reefs in the Little Dal Formation.

Welcome North Mines Ltd. continued mapping and prospecting of the AB and CAB claims (81). Diamond drilling later in the season tested several new lead-zinc showings in Sekwi Formation.

Uranium

The expansion in uranium exploration evident in 1976 continued apace this year. Extensive reconnaissance in many areas from Baffin Island to the western edge of the shield and the southern Keewatin, was accompanied by important drilling projects west of Baker Lake and in the Dismal Lakes area, west of Coppermine.

Keewatin Region

Small *Denison Mines* field party prospected claims near Poorfish Lake (2).

Uranerz Exploration and Mining Limited had three crews of eight to twelve people in the Keewatin. One crew investigated the potential of Aphebian sediments north and north-west of Poorfish Lake (2). A second crew did reconnaissance and detailed geophysical, geological and geochemical surveys of prospecting permit areas in the Sand Lake area (19). The third crew, camped on Amer Lake (17), mapped the sediments of the Amer Group.

Urangesellschaft Canada Limited had three 20- to 30-person crews and one 10-man diamond drill crew investigate their properties. One crew discovered 11 new uranium showings in the Yathkyed-Tulemalu Lakes area (9). These showings and those discovered last year were mapped, surveyed with scintillometer, VLF-EM and magnetometers and some were trenched. A second crew mapped and prospected the western edge of the Thelon Basin from Beaverhill Lake (13). The third crew, camped at the west end of Schultz Lake (16) did detailed geophysical, geochemical and geological surveys of prospecting permits and claims in the Baker-Aberdeen Lakes area. Six holes, totalling 2,500 feet, tested a uranium showing north of Sissons Lake (15).

Pan Ocean Oil Ltd. prospected and surveyed anomalies detected during the 1976 airborne survey of prospecting permits in the Yathkyed-Tulemalu Lakes area (9). Uranium showings staked last year were trenched.

Noranda Exploration Company, Limited prospected the northern and western edges of the Dubawnt Group basin in the Yathkyed-Tulemalu Lakes area (9), and staked numerous claims. An undisclosed amount of drilling was done in September.

Essex Minerals Company Ltd. engaged Barren Lands Exploration Services Ltd. to geophysically survey and prospect their claims in the Yathkyed-Tulemalu (9) and Schultz Lake (16) areas.

Cominco Ltd. mapped and prospected claims south of Nowleye Lake (10), mapped in detail and drilled 1,500 feet on uranium showings optioned from Aquitaine Company of Canada Ltd. at Amer Lake (17).

Shell Canada Ltd. crews camped at Outlet Bay (11) on Dubawnt Lake and at Mosquito Lake (12), prospected and mapped the basement and Dubawnt Group remnants within their prospecting permit areas and claim groups. An eight-man drill crew camped east of Outlet Bay, drilled 2,500 feet on uranium showings in the Dubawnt Group volcanics.

Western Mines Ltd. had five crews mapping a belt of Amer Group sediments extending west southwest from Amer Lake (18).

Arctic Islands

Uranerz Exploration Ltd. did airborne radiometrics and ground surveys in ten permit areas on the Borden Peninsula of Northern Baffin Island (22).

Noranda Exploration Company, Limited prospected out of Arctic Bay (23) and Grise Fiord (24).

Western Churchill Province and East Arm Subprovince

Imperial Oil Ltd. reconnoitered around Wholdaia Lake (26).

Denison Mines Ltd. did geochemical work on their Scott Lake claims (27).

Power Reactor and Nuclear Fuel Development Corporation of Japan explored along the Northwest Territories – Saskatchewan boundary (28) and staked claims south of Thekuthili Lake (31).

Uranerz Exploration Ltd. conducted airborne radiometric and ground surveys of the Nonacho Basin and staked a large block of claims north of Salmon Lake (30).

Seru Nucleaire Ltd. reconnoitered the Nonacho Lake area (31) and the East Arm of Great Slave Lake (34).

Canadian Occidental Petroleum Ltd. did geochemical and radiometric studies on claims east of Hjalmar Lake (32).

Gowganda Silver Mines Ltd. Prospected and staked several claims north of Talston Lake (33).

Saskatchewan Mining and Development Corporation evaluated, staked and geochemically surveyed parts of the Tazin gneisses, near Hill Island Lake (28).

Highwood Resources Ltd. of Calgary prospected, sampled and mapped a large block of claims near the Blachford Lake Complex (36) where several showings are variably mineralized with niobium, uranium, thorium or fluorite.

Bear Province

Rayrock Mines Ltd. (45) explored that portion of the Bear Province south of 64°. Measurements of radon gas in soils and ground scintillometer surveys were combined with examination of all radioactive showings reported in the area. A few claims were staked. Rayrock drilled 9 holes totalling 2,156 feet on the SUN-ROSE group (43) optioned from Crestland Mines.

Uranerz Canada Ltd. mapped most of the Hornby Bay Group and Dismal Lakes Group rocks at one inch to one mile. This project was supplemented with local airborne and ground radiometric geochemical surveys. Uranerz drilled, 1,500 feet in 7 holes on the UGI claims and trenched on the JONES claims both south of (46).

Imperial Oil Ltd. in joint venture with *Eldorado Nuclear Ltd.* sampled lake sediments and some anomalies along a belt extending from Marian Lake (44) to Hottah Lake (48) mainly in areas underlain by Proterozoic rocks (47). About a fifth of this area was covered by a helicopter-borne radiometric survey.

Conwest Exploration Company Ltd. checked lake sediment anomalies which extend along and adjacent to the Snare Group (46).

Chevron-Standard Ltd. surveyed the large WOP claim block (46) by geological mapping and ground radiometrics. Small amounts of helicopter-borne radiometric and lake sediment surveys were also done.

Noranda Exploration Company Limited drilled several thousand feet on the NAGA claims (49) in 86 E/3 and several holes were drilled at Fenwick Lake on Noranda's 86 E/6 Permit. A few trenches were excavated on the 86 E/7 Prospecting Permit. Several properties in the Bathurst Inlet area (70) were covered by geological, radiometric and geochemical surveys. One inch to half mile mapping and lake sediment sampling covered parts of the Kilohigok Basin. The MAG, SAR, ZEN and NOD claims (43) were covered by prospecting, mapping and geophysics.

Cominco Ltd. tested the KUM claims (52) with 6 holes totalling 545 metres. A showing was trenched on the RAH claims (53) and the surrounding area was staked by Cominco and others. Airborne radiometric surveys covered an area mainly underlain by Hornby Bay Group sediments adjacent to the RAH group. Seven holes totalling 425 metres were drilled on Cominco's POMIE group south of Bathurst Lake (71).

B.P. Minerals Ltd. mapped the Aphebian-Helikian unconformity and did lake sediment, soil and ground and aerial radiometric surveys on the 86 J/12, 13 and 14 Prospecting Permits (54) and on their extensive claims holdings which extend into the Lac Rouviere Area to the northwest (55). BP previously had prospecting permits here on 86 H/2,3,4.

Hudson Bay Oil and Gas Ltd. explored the Aphebian-Helikian unconformity, flew radiometric surveys, checked anomalies on the ground and sampled lake bottom sediments, on their two Prospecting Permits 86 K/10, 12 (53). Hudson Bay Oil and Gas Ltd. staked near the permits in the vicinity of Cominco's RAH group.

Gulf Minerals Ltd. reconnoitered five Prospecting Permits, areas 86 L/15, 16 and 86 M/1, 7 and 8 to the northwest of Dease Arm (56), Great Bear Lake.

Imperial Oil Ltd. drilled fifty-four holes totalling 6,200 metres on the YUK group in the Dismal Lakes area (55). Seven holes tested a proposed airstrip; the remainder were for mineral exploration. Although most of the footage was diamond drilled, percussion drilling was also used, particularly in overburden. Imperial also did a minor amount of mapping, geophysical surveying and testing of geophysical techniques.

Mining Production

The value of mining production sales in the Yukon was \$210 million (excluding coal and natural gas), the second highest, after 1975's \$230 million, since mineral production began in 1886. The Territory's five mines produced zinc, lead, asbestos, silver, copper, gold, cadmium and coal.

The mines employed 1,347 persons, an increase of 101 persons over the 1976 figure.

Lead-zinc-silver

Cyprus Anvil Mining Corporation

The company experienced a shortage of qualified tradesmen for concentrator maintenance which adversely affected mill tonnage for the first half of 1977. By the second half of the year the situation had improved. New and larger mining equipment was placed into service replacing the older and smaller equipment.

Cyprus Anvil Mining Corporation

Type:	Open-pit
Location:	209 km northeast of Whitehorse
Product:	Zinc, lead, silver, gold
Rate:	9 124 tonnes per day
Tons Milled:	3 116 035 tonnes
Reserves:	37 467 114 tonnes
Reserve Grade:	3.1 per cent lead, 5.5 per cent zinc, 31.1 grams per tonne silver
Employees:	529

Silver-lead-zinc-cadmium

United Keno Hill Mines Ltd.

Production came from five underground mines (Husky, Dixie, Keno, Elsa and No Cash) and two open pits with the Husky Mine contributing 42 per cent of the underground mill feed and accounting for 52 per cent of the silver production.

United Keno Hill Mines Ltd.

Type:	Underground and open-pit
Location:	50 km northeast of Mayo
Product:	Silver, lead, zinc, cadmium
Rate:	333 tonnes per day
Tons Milled:	83 908 tonnes
Reserves:	114 264 tonnes (proven plus probable)
Reserve Grade:	4.8 per cent lead, 1.1 per cent zinc, 1363 grams per tonne silver
Employees:	294

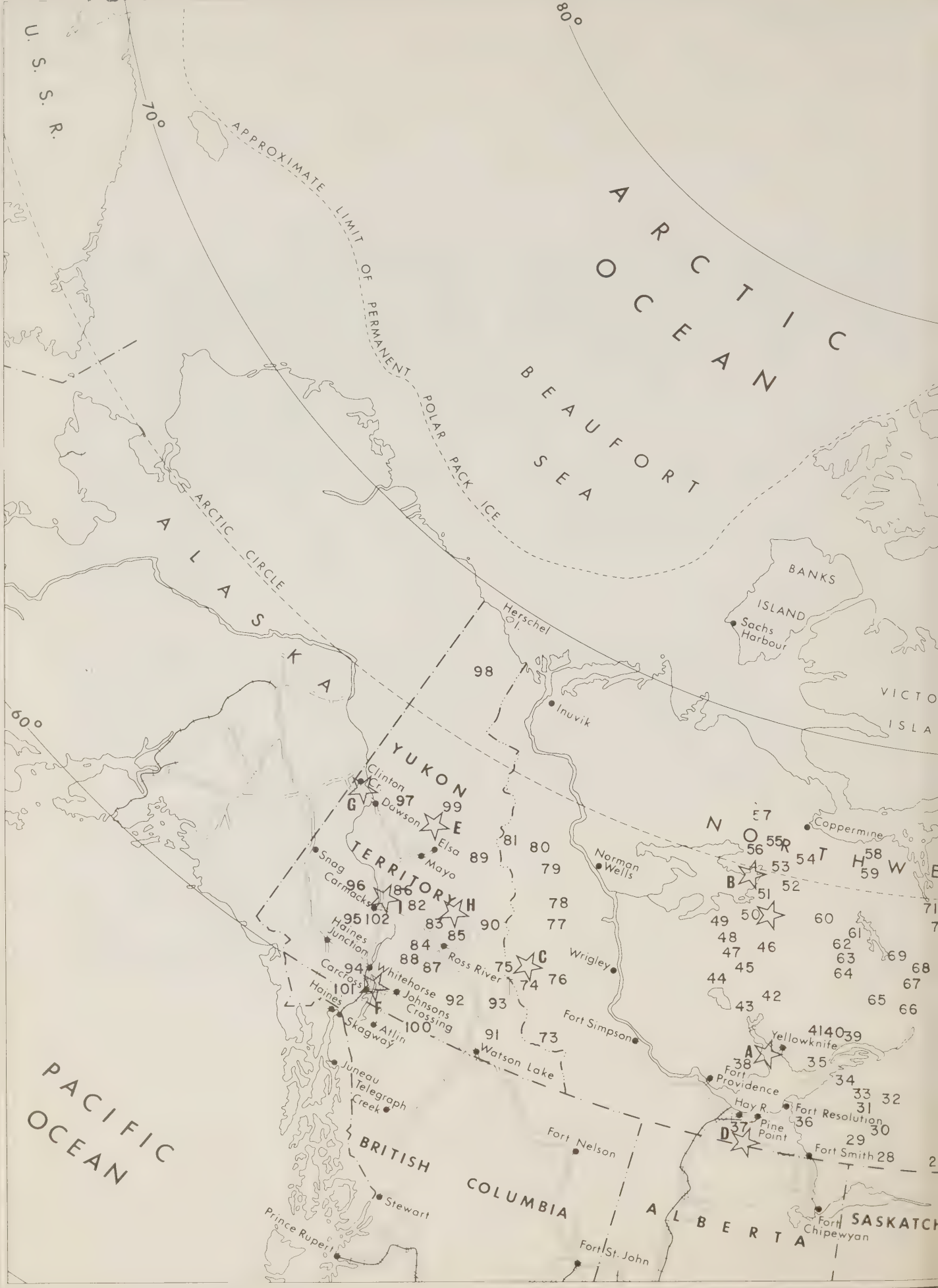
Copper

Whitehorse Copper Mines Ltd.

Whitehorse Copper continued to carry out substantial exploration work on the Whitehorse Copper Belt but with little success. The present orebodies are well defined and it is unlikely that additional ore of any significance will be found in the known ore zones. The mine has sufficient ore reserves to continue operations until the middle of 1981.

Whitehorse Copper Mines Ltd.

Type:	Underground
Location:	11 km south of Whitehorse
Product:	Copper, silver, gold
Rate:	2 243 tonnes per day
Tons Milled:	818 590 tonnes
Reserves:	2 893 810 tonnes
Reserve Grade:	1.8 per cent copper
Employees:	208



MINERAL EXPLORATION AND MINING - YUKON & N.W.T.

SCALE OF MILES
0 100 200 300 400

LEGEND



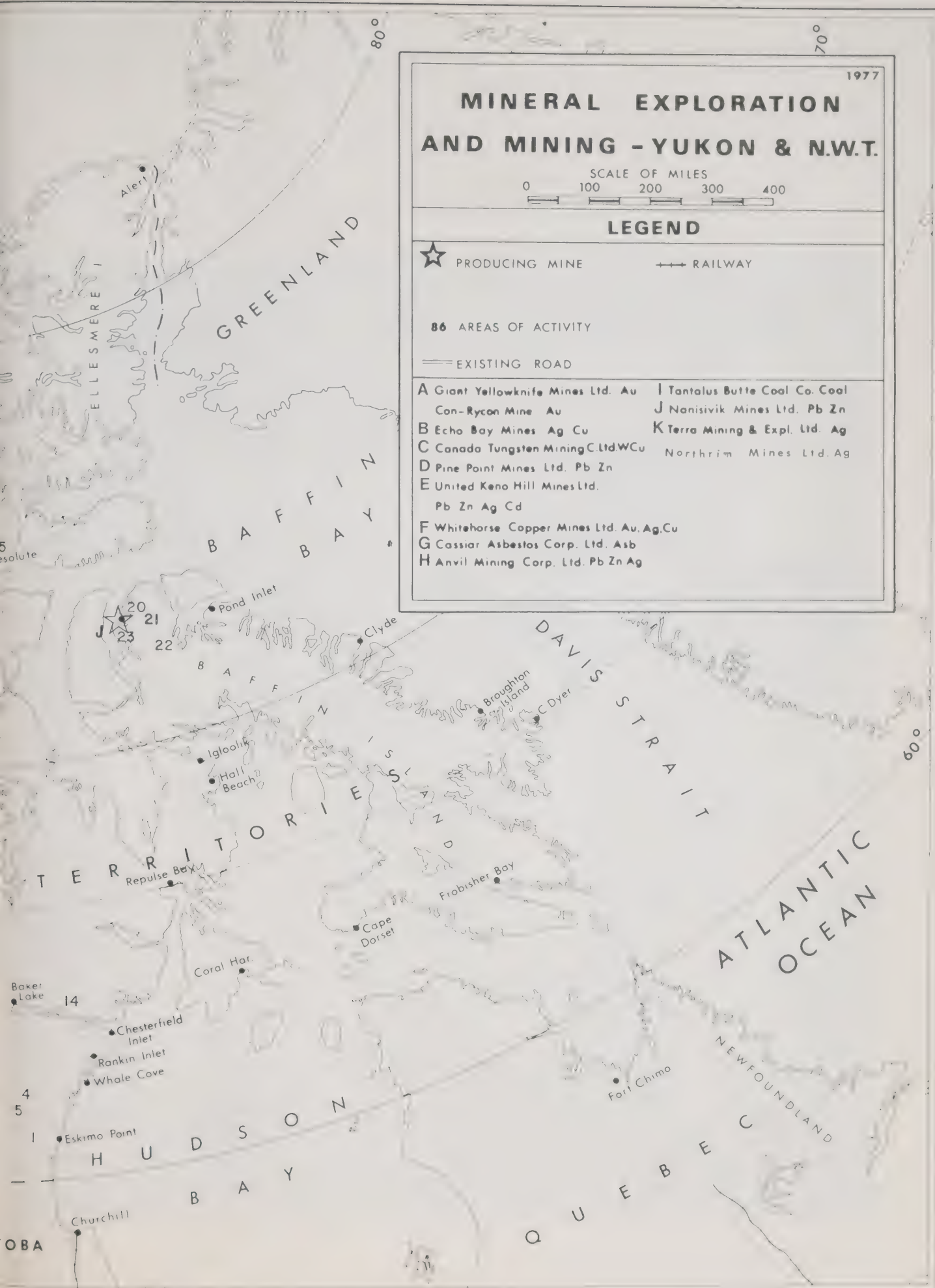
PRODUCING MINE

RAILWAY

86 AREAS OF ACTIVITY

EXISTING ROAD

- | | |
|---|--------------------------------|
| A Giant Yellowknife Mines Ltd. Au | I Tantalus Butte Coal Co. Coal |
| Con-Rycon Mine Au | J Nanisivik Mines Ltd. Pb Zn |
| B Echo Bay Mines Ag Cu | K Terra Mining & Expl. Ltd. Ag |
| C Canada Tungsten Mining C. Ltd. W Cu | Northrim Mines Ltd. Ag |
| D Pine Point Mines Ltd. Pb Zn | |
| E United Keno Hill Mines Ltd. | |
| Pb Zn Ag Cd | |
| F Whitehorse Copper Mines Ltd. Au, Ag, Cu | |
| G Cassiar Asbestos Corp. Ltd. Asb | |
| H Anvil Mining Corp. Ltd. Pb Zn Ag | |



Asbestos

Cassiar Asbestos Corporation

Mineable ore reserves were reduced by one million tonnes when the company was unable to continue mining the Porcupine orebody because of the deterioration and subsequent instability of the pit walls. The mine will close in mid-1978.

Cassiar Asbestos Corporation

Type:	Open-pit
Location:	80 km northwest of Dawson City
Product:	Asbestos fibre
Rate:	3 728 tonnes per day
Tons Milled:	1 207 151 tonnes
Reserves:	698 539 tonnes at 6.18 per cent fibre
Employees:	304

Coal

Tantalus Butte Coal Co.

Tantalus Butte more than doubled its 1976 production to meet the demand for coal to dry concentrates at the Anvil Mine which is also owned by Cyprus Anvil Mining Corporation.

Tantalus Butte Coal Co.

Type:	Underground and surface stripping
Location:	Carmacks
Product:	Coal
Rate:	84 tonnes per day
Tons Produced:	18 779 tonnes
Reserves:	Not known
Reserve Grade:	Thermal coal
Employees:	12

A team from Whitehorse Copper Mines Ltd., represented the Yukon Territory at the 1977 mine rescue competition held in Yellowknife, seen here receiving instructions by radio during the competition.



Mineral Exploration

Expenditures on mineral exploration in the Yukon continued at a high level reaching \$17.8 million with many companies seeking lead, zinc, silver, uranium, tungsten and coal deposits.

The number of claims (quartz and placer) staked increased by 9.5 per cent over 1976 to 13,118, the second year in a row to show an increase. The number of claims in good standing rose from 36,615 in 1976 to 41,865 in 1977.

Lead-Zinc-Silver

The Anvil district continued to be active this year with some companies conducting drilling programs and others re-examining ground that has been neglected since soon after the discovery of the Faro orebody in 1965. *Cyprus Anvil* (83), *Amax* (82) and *Welcome North* (83) were all active. *Anvil* drilled throughout the summer attempting to delineate the new DY zinc-lead deposit, discovered between the Vangorda and Swim deposits in the same graphitic phyllite horizon, but at a depth of 2,000 feet.

The feasibility study on the adjacent 27 million ton GRUM (83) zinc-lead deposit of *Kerr Addison* and *Canadian Natural Resources* is expected to be completed early in 1978.

Southeast of the central portion of the Anvil Belt, *Dupont of Canada Exploration Ltd.* (85) started drilling on its large claim group north of Ross River, identifying the favourable stratigraphic units of the district.

In the extreme northwest portion of the Anvil district, *MacMillan Joint Venture (Conwest Exploration Company Limited and Essex Minerals Company)* (86) completed a precise gravity survey of the SUE claim block, with EM and soil geochemical surveys being done on the gravity anomalies in selecting drill targets. The lithology is correlated with that of the Anvil district.

Welcome North Mines and *Getty Mining Pacific* (84) staked and explored several hundred claims southeast of Faro that have occurrences of stratiform base metal sulphides over a strike length of about 10 miles in Paleozoic meta-sediments. Mapping, geochemical surveys and EM surveys were conducted with a short diamond drill program late in the season.

Several programs were continued in the Mississippian felsic volcanic belt of the Pelly Mountains during 1977. *Cyrus Anvil* and *Hudson Bay Oil and Gas* did a further 5,400 feet of diamond drilling on the MM property. Stratiform, massive and interlayered sulphides (pyrite, sphalerite, pyrrhotite, galena and chalcopyrite) and metavolcanics are associated with pyritic chert and barite beds.

Dupont of Canada Explorations Ltd. (87) in joint venture with *Aquitaine* and *Rosario Resources*, did detailed property work and 1,500 feet of diamond drilling on the MAT property of *Welcome North*. Here, shale containing stratabound galena, pyrite, sphalerite and arsenopyrite is overlain by pyritic rhyolite and intruded by a hypabyssal syenite stock, the stock containing phases high in rare earths.

Amax and *Utah Mines Ltd.* (88) did property work to the north, still within the volcanic belt. *Newmont Exploration of Canada Ltd.* (87) examined the JOE claims on the east side of the volcanic belt where two horizons containing massive sulphides occur at the same horizon as a pyritic barite unit.

McIntyre Mines Ltd. continued work on the stratabound lead-zinc-silver prospect which was discovered in 1976 immediately north of the Nadaleen River (89). Coarse grained sphalerite and argentiferous galena occur as filling in a brecciated, silicified dolomite of the Hadrynian Grit unit. Along strike the dolomite is variably mineralized and three zones have been recognized over a two mile distance. During 1977, a further 16,000 feet of diamond drilling was done in delineating the mineralized zones.

Ogilvie Joint Venture explored the JASON lead-zinc-barite discovered in 1975 near MacMillan Pass (90). The deposit is similar to the adjacent TOM property of Hudson Bay Mining where in 1970 some 7 million tons grading 8 per cent lead, 8 per cent zinc and 2.7 ounces of silver was outlined. To test the interpretation that the two deposits were connected at depth, an attempt was made to drill a deep hole using an oil well rig in July of 1977. Mechanical and ground problems forced the abandonment of this operation at 500 feet. Overburden drilling was conducted to establish local stratigraphy and assess geochemical anomalies and a further 4,600 feet of diamond drilling explored mineralized zones.

These deposits are near the base of a silver weathering black shale of the Devono-Mississippian Canol Formation and consist of interlayered barite, shale, galena, sphalerite and pyrite.

On the TOM property *Hudson Bay Mining* (90) did further geological mapping, ground EM surveys and prospecting.

Cominco, Canadian Nickel Company Ltd. and *Brinex* did detailed surface work on similar rocks in the area.

Canex Placer and *U.S. Steel* continued the exploration of the Howards Pass zinc-lead property in the Selwyn Mountains 160 miles north of Watson Lake (75) and along the Yukon-Northwest Territories border. A further 16,000 feet of diamond drilling was done in delineating mineralized zones. Work has gone on since the initial discovery of high grade galena and sphalerite in 1972, with the deposit emerging as being extremely large but showing numerous problems in establishing mineable zones. Showings occur over a strike length of 16 miles.

Noranda Explorations did further drilling on the Quartz Lake property 40 miles northeast of Watson Lake (91). This property, which has been explored intermittently since 1948, is a conformable lead-zinc-silver massive sulphide deposit occurring within a sequence of Hadrynian limestone and limy argillite.

Hudson Bay Mining and Exploration drilled phyllites near the headwaters of the Liard (92). No significant mineralization was reported.

A potentially significant silver-lead-zinc discovery was made for *Welcome North Mines* in late August 1977 by prospector Art Johns. The MAXI property (93) southeast of Tillie Lake, is host to quartz-siderite(?) galena-sphalerite mineralization lying within black phyllite of the Road River Formation. The mineralization occurs in tabular lenses of varying width (1 mm to 0.3 m) that are conformable to the foliation of the enclosing phyllite.

Copper

Whitehorse Copper Mines Limited (94) at Whitehorse continued exploration for other mineralized skarns in the Whitehorse Copper Belt in addition to the one presently being mined. I.P., magnetic surveys and 18 drill holes totalling 9,700 feet did not outline further ore zones. The setting of the deposits is in skarns developed in Triassic limestone adjacent to granodiorite and diorite of the Coast Range Intrusions.

About 100 miles west of Whitehorse, near Aishihik Lake (95), the company drilled 18 holes totalling 3,600 feet into a chalcopryrite bearing skarn conformable with Yukon Group sediments.

Archer, Cathro and Associates did a further 2,800 feet (8 holes) of diamond drilling on the CASH (96) property in the Dawson Range, a low-grade copper-molybdenum prospect. The mineralization is associated with a small, irregular, early Tertiary felsic porphyry with coeval volcanic flows and breccias. Hydrothermal alteration and breccias (pyrite, chalcopyrite and molybdenite) are concentrically zoned in the classical pattern of such porphyry deposits. The alteration is dominated by a strong potassic facies surrounded by a propylitic zone. Phyllic alteration is locally intense but irregular; argillic alteration is rare.

Uranium

Several companies did regional reconnaissance for uranium in southern Yukon, but little ground was staked. North of Dawson City *Chevron Standard, Urangesellschaft* and *Archer-Cathro* (97) staked claims on which pitchblende occurs in vein systems in Cretaceous alkaline syenites of the Tombstone Mountains.

In the Blow River area near Mt. Fitton (98) *Aquitaine* prospected and explored radioactive showings on their claim blocks. Showings are present in several sedimentary settings, but most are associated with Mississippian to Jura-Cretaceous cherts, cherty argillites, chert fragment breccias and conglomerates.

Eldorado Nuclear drilled eight holes totalling 1,140 feet on the BOND (99) claims. Uranium mineralization occurs in brecciated siltstones.

Tungsten

Amax drilled the LOGTUNG property near Logjam Creek (100) along the British Columbia-Yukon border, demonstrating low grade tungsten and molybdenite.

Antimony

Con Am Resources (101) continued the examination of its antimony prospect on Carbon Hill south of Whitehorse. The occurrence has been explored at various times since 1914 by surface and underground workings. The 1977 program involved 17 holes diamond drilled from some of the earlier underground workings, as well as further surface mapping and trenching. Sulphide mineralization occurs as fine pyrite and stibnite as well as massive knots of coarse stibnite crystals with quartz gangue in irregular patches within a shear zone 4 to 5 feet wide in altered rhyolite to dacite volcanic rock.

Coal

Cyprus Anvil Mining Corp. continued its exploration for coal in the Carmacks Area (102). The coal is used for drying the concentrate at the Anvil mine at Faro, 100 miles to the east. Adjacent to the operating Tantalus Butte Mine, coal seams within the Upper Jurassic to Lower Cretaceous Tantalus Formation were explored by resistivity, I.P., gravity and down-hole EM. A series of 42 holes for a total depth of 11,407 feet were drilled by a 5 1/2" rotary-percussion drill. This program outlined further coal reserves. On the Carmacks South Coal leases, about one mile southeast of the town of Carmacks, geophysical surveys outlined drill targets on coal seams within the mid-Jurassic Laberge Group. Eight miles NW of Carmacks, the Five Fingers Coal leases, over coal seams in the Laberge Group were mapped.

Northern Non-Renewable Resources Branch

Mining Division

Responsibilities

This division is responsible for the administration of mining and mineral rights (excluding oil and gas) from the time a claim is acquired to the production stage, including safety in mines. The division comprises three sections – Mining Lands, Mining Geology and Mining Engineering. The responsibility for these operations rests with the Chief, Mining Division.

Department of Indian Affairs and Northern Development

Minister: J.H. Faulkner, Ottawa, Ontario

Deputy Minister: A. Kroeger, Ottawa, Ontario

Assistant Deputy Minister: E. Cotterill, Ottawa, Ontario

Northern Non-Renewable Resources Branch

Director: H.W. Woodward, Ottawa, Ontario

Regional Director (Y.T.): B.J. Trevor, Whitehorse, Y.T.

Regional Director (N.W.T.): R.W. Hornal, Yellowknife, N.W.T.

Assistant Regional Director, Non-Renewable Resources,

Yukon: R.R. McLeod, Whitehorse

Assistant Regional Director, Non-Renewable Resources,

Northwest: M.J. Morison, Yellowknife

Mining Division

Chief: J.M. Patterson, Ottawa, Ontario

Mining Lands Section

Head: T.W. Dent, Ottawa, Ontario

Assistant Head:

(Yukon) vacant

(N.W.T.) P.M. Corrigan, Ottawa, Ontario

Supervising Mining Recorders:

B.R. Baxter, Whitehorse, Y.T.

R.L. Williams, Yellowknife, N.W.T.

Mining Recorders:

B.E. Sias, Whitehorse, Y.T.

L.A. Ball, Dawson, Y.T.

R.G. Ronaghan, Mayo, Y.T.

V.W. Johanson, Watson Lake, Y.T.

E.D. Cook, Yellowknife, N.W.T.

J.G. Black, Yellowknife, N.W.T.

Mining Engineering Section

Yukon

Regional Mining Engineer:

T. Csizmazia, Whitehorse, Y.T.

District Mining Engineer: Vacant

Electrical-Mechanical Engineer: Vacant

Mine Rescue Superintendent:

J.D. Barraclough, Whitehorse, Y.T.

Claims Inspector: G.W. Gilbert, Whitehorse, Y.T.

Environment Technician: W. Wong, Whitehorse, Y.T.

Northwest Territories

Regional Mining Engineer: M.L. Brown

District Mining Engineer:

E. Bengts, Yellowknife, N.W.T.

Environmental Control Engineer: Vacant

Mine Rescue Superintendent:

N. Boss, Yellowknife, N.W.T.

Claims Inspector: D. Cormier, Yellowknife, N.W.T.

Mining Geology Section

Head: Vacant

Evaluation Geologist: T.W. Caine, Ottawa, Ontario

Yukon

Regional Geologist: D.B. Craig

Project Geologist: M. Marchand

District Geologist: J.A. Morin

Staff Geologist: Vacant

Northwest Territories

Regional Geologist: W.A. Padgham

Project Geologist: A.F. Bau

Keewatin District Geologist: P.J. Laporte

Arctic Islands and Western Churchill Province District

Geologist: W.A. Gibbins

Mackenzie District Geologist: J.M.B. Seaton

Nahanni District Geologist: C.C. Lord

Staff Geologists: E.J. Hurdle and J. Goodwin

Mining Lands Section

For administrative purposes, the territories have been divided into seven mining districts. A mining recording staff is responsible for the disposition of mineral rights within each district in accordance with the applicable legislation. For each territory, there is a Supervisory Mining Recorder whose principal function is to ensure that uniform practices are observed in the administration of the various mining acts and regulations.

The districts and location of Mining Recorders Offices are as follows:

	District	Office
<i>Yukon Territory</i>	Dawson	Dawson, Y.T.
	Mayo	Mayo, Y.T.
	Watson Lake	Watson Lake, Y.T.
	Whitehorse	Whitehorse, Y.T.
<i>Northwest Territories</i>	Mackenzie	Yellowknife, N.W.T.
	Nahanni	Yellowknife, N.W.T.
	Arctic and Hudson Bay	Yellowknife, N.W.T.

Mineral claims staked and recorded in the Yukon Territory and Northwest Territories during the year, with comparative figures for 1976 are tabulated below:

Yukon Territory

District	Claims 1976	Recorded 1977
Whitehorse	2,329	2,630
Dawson	2,681	1,749
Mayo	4,480	2,854
Watson Lake	2,490	5,885
Total	11,980	13,118

Northwest Territories

District	Claims 1976	Recorded 1977
Mackenzie	11,471	14,351
Arctic and Hudson Bay	7,917	6,682
Nahanni	350	823
Total	19,738	21,856

Mining Engineering Section

This section is responsible for advice regarding the Mining Safety Ordinances and Mining Safety Rules and Regulations in mines as well as the Blasting Ordinance and Regulations in the Yukon and the Explosives Use Ordinance in the Northwest Territories and for amendments and the preparation of new safety legislation when required.

A Regional Mining Engineer is stationed at Whitehorse in the Yukon and at Yellowknife in the Northwest Territories. He is the senior mining engineer with a staff which includes a District Engineer, Electrical-Mechanical Engineer, Environmental Engineer, Mine Rescue Superintendent, Claim Inspector and clerical staff who are responsible for:

- inspection of mines, quarries and blasting operations to ensure compliance with safety legislation;
- inspection of mineral claims to ensure compliance with the Yukon Quartz Mining Act, the Yukon Placer Mining Act and the Northwest Territories Canada Mining Regulations;
- ensuring that sufficient mine personnel are trained in mine rescue, recovery operations and first aid;
- conducting ventilation and dust surveys, monitoring radioactive contamination, and carrying out environmental studies of all underground and surface mining properties.

Mine Rescue

Central Mine Rescue Stations are maintained at Whitehorse, Yukon and Yellowknife, Northwest Territories. Substations are established at each mine. The Department now owns 101 Drager GB-174 four-hour breathing apparatus. It is the policy of the Department to have a minimum of 12 Drager units at each mine so that the mine rescue team can begin a rescue operation before the arrival of trained personnel from the central station.

Mine Rescue teams from both Territories compete in the Canadian Mine Rescue Championship each year. In 1977 the competition was sponsored by the Northwest Territories and was held in Yellowknife. The Devco team from Nova Scotia won the competition.

Mining Safety Statistics

Yukon and Northwest Territories

The USA Standard Method of Recording and Measuring Work Injury Experience is used in the mining industry in the North. In accidents resulting in death, permanent total disability or permanent partial disability in the Territories, the number of days recorded as lost-time conforms with the time charges set down in the American Standard.

Disabling injuries are defined by the USA Standard as being those which result in death, permanent total disability, permanent partial disability or temporary total disability.

Days recorded as lost-time do not include the day of the accident or the day of return to work.

Accident frequency is expressed as the number of accidents per one million man-hours worked.

Accident severity is expressed as the number of days lost due to accidents per million man-hours worked.

Accident Statistics – 1977

During the year, there were 48 disabling injuries reported in the Yukon Territory. The accident frequency for disabling injuries increased in 1977 from 13.93 to 17.58. There was a decrease in the accident severity rate from 471 last year to 352. "fall of persons" was the main cause of accidents followed by "strain while lifting" and "burns and cuts". These three main causes accounted for 60 per cent of all accidents reported. There were no fatal mine accidents in the Yukon Territory in 1977.

In the Northwest Territories, 133 disabling injuries were reported. The accident frequency rate decreased from 36.43 last year to 34.68 and the severity rate from 13,319 to 2,270. "fall of persons" was the main cause of accidents in the Northwest Territories, accounting for 19 per cent of all accidents. This was followed by "strain while lifting", "caught between two objects", and "miscellaneous causes". These four main causes accounted for 58 per cent of all accidents reported. One fatal accident occurred in 1977 at the Nanisivik Mine when a mill operator died of head injuries when struck by a lime pallet.

Mining Geology Section

This section provides a geological information and advisory service to the mineral industry in the northern territories. Regional Geologists' offices are maintained at Whitehorse, Yukon and Yellowknife, Northwest Territories.

Two core libraries, the H.S. Bostock library at Whitehorse and the C.S. Lord library at Yellowknife, provide means for preserving valuable diamond drill core data for the mineral industry. Each has laboratory facilities for core splitting, diamond-saw cutting, thin-section preparation and core storage.

In co-operation with the Geological Survey of Canada, the Yukon Chamber of Mines and the Northwest Territories Chamber of Mines, geoscience forums were held in the fall of 1977 at Whitehorse and Yellowknife. Well attended by the mining and exploration communities, these meetings are held on an annual basis.

Regional and District Geologists carry out mineral property examinations, collect rock and mineral specimens and advise the mineral industry, government departments and research scientists on geological problems arising from their work in the Territories. The service includes carrying out geological evaluations on mining developments in the Yukon and Northwest Territories whenever government assistance is requested.

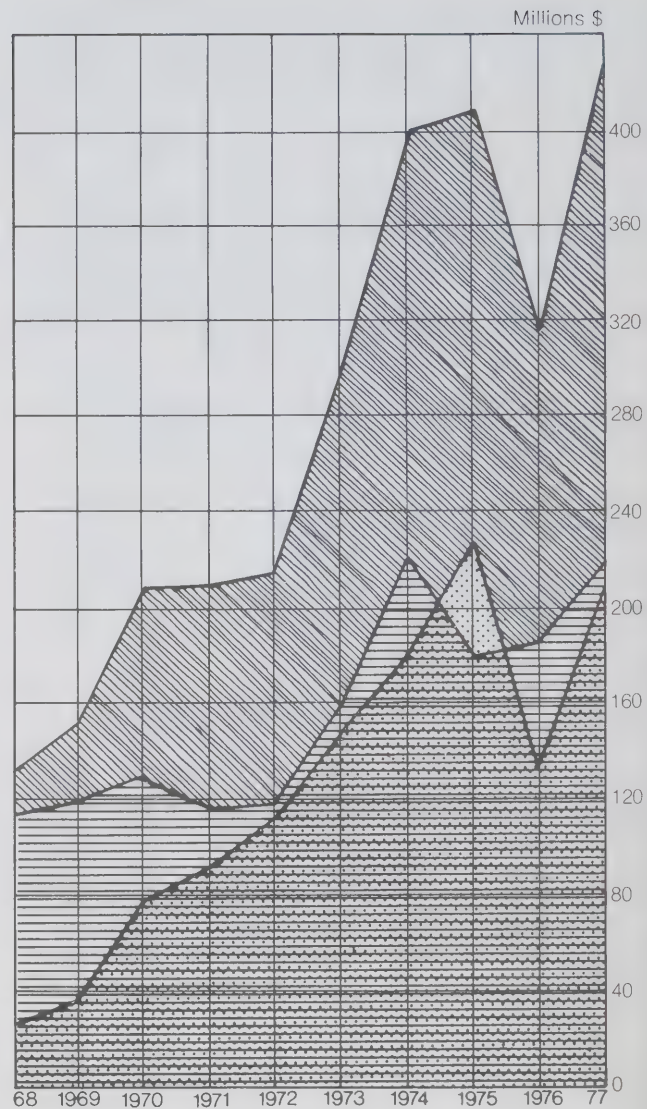
Department geologists assist prospectors and other geologists in identifying rock and mineral specimens by giving prospector training courses, in preparing geological compilation maps on mineralized areas and giving direction when requested.

Mineral Claims Recorded

Value of Production



- Claims Recorded NWT
- Claims Recorded Yukon
- - - Total Claims Recorded
- . - Claims in Good Standing



- YUKON
- NWT
- TOTAL

Mineral Production Chart 1968-1977

Northwest Territories

Mineral	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977(a)	Cumulative Totals(b)
Gold	\$ 15,287,194 g 10,957,941	12,341,240 10,217,554	12,188,776 10,352,606	13,597,931 9,590,415	17,713,250 9,563,666	24,252,894 7,747,098	28,651,414 5,737,565	38,796,147 5,460,651	21,390,261 6,162,252	23,962,000 5,847,000	131,331,343
Silver	\$ 8,677,365 g 116,686,653	3,910,888 63,027,059	5,114,587 85,989,978	4,474,616 91,209,266	6,778,965 126,257,130	13,691,769 168,591,544	17,669,851 118,728,409	8,883,385 61,319,168	14,342,774 103,795	20,414,000 129,000	88,540,542
Copper	\$ 833,169 kg 785,695	643,761 567,772	766,578 598,970	727,595 625,060	577,416 514,268	1,106,319 786,610	840,719 491,923	526,889 374,885	639,980 424,469	510,000 333,000	9,151,859
Nickel	\$										12,850,205
Lead	\$ 33,636,984 kg	32,299,014 96,576,048	37,842,405 108,502,061	22,629,795 76,034,832	27,838,277 81,846,189	32,261,787 90,667,291	34,932,761 76,524,844	37,254,292 83,390,558	26,440,157 52,942,453	40,087,000 58,370,000	361,212,533
Zinc	\$ 57,504,129 kg 134,988,894	68,275,481 203,343,645	76,004,563 216,416,132	75,056,384 203,496,733	64,792,006 154,103,925	87,541,226 164,449,732	132,251,480 171,886,138	106,850,304 129,002,037	122,438,035 147,610,457	127,401,000 164,963,000	835,896,342
Uranium(d)	\$										120,038,145
Cadmium	\$ 774,060 kg 123,196	675,136 86,999	737,632 93,984	301,476 70,468	205,436 36,832	61,152 7,620		1,027 137	3,179 549		8,755,025
Bismuth	\$		3,072 222	41,149 3,437							44,221
Tungsten	\$										
Total	\$ 114,711,166 kg	118,185,520	132,637,613	114,228,949	117,905,350	158,825,167	214,346,225	182,069,944	188,254,206	211,271,000	1,838,070,721

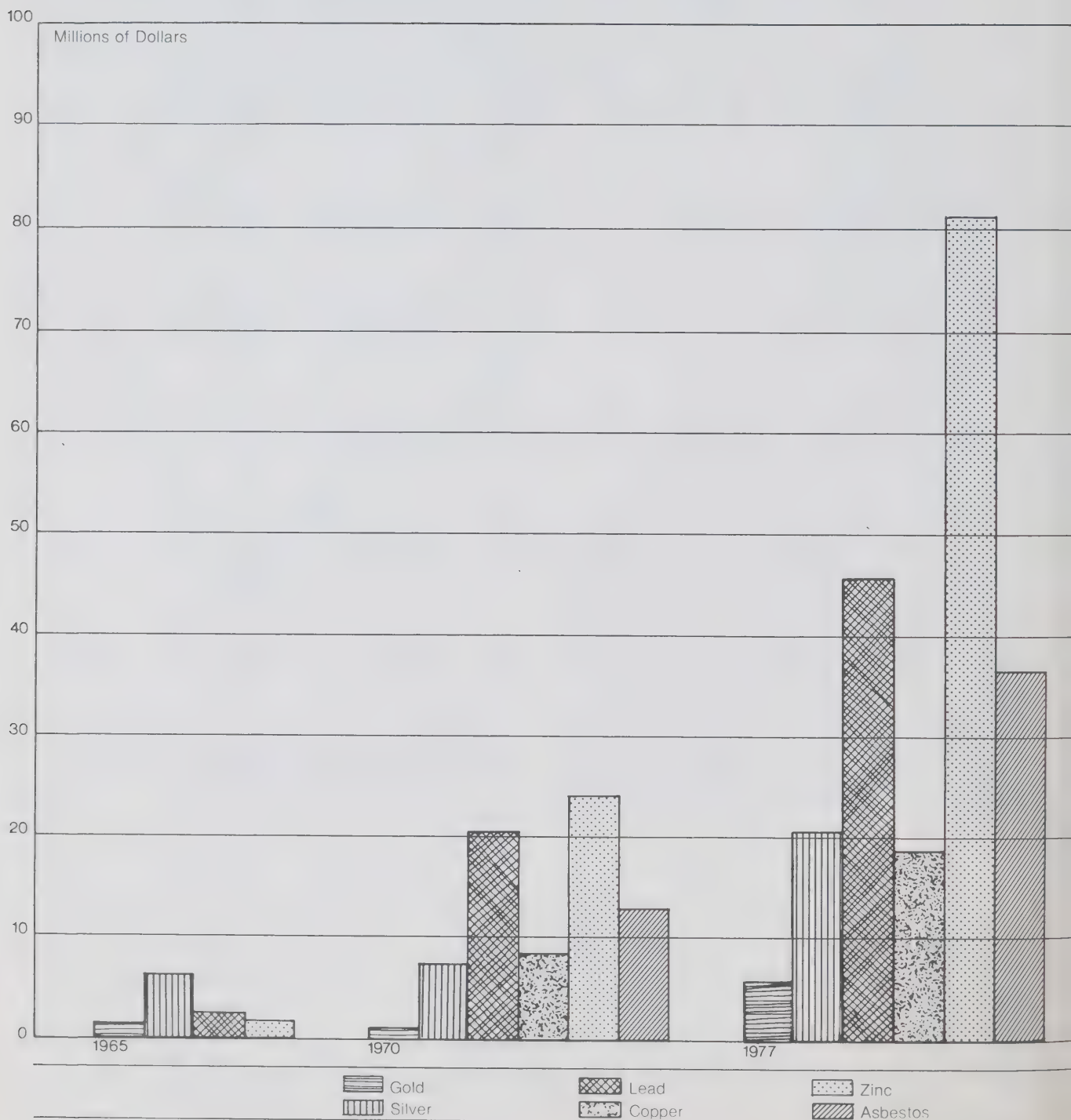
Yukon Territory

Yukon Territory											(c)
Gold	\$ 911,338 g 751,678	1,118,715 923,213	653,034 555,570	511,531 450,161	234,983 126,871	2,032,502 648,974	4,111,631 823,371	5,254,077 997,986	4,401,075 1,111,949	5,345,000 1,182,000	23,106,635
Silver	\$ 4,806,384 g 64,632,620	5,182,166 83,514,702	7,845,312 131,900,794	8,966,417 178,773,547	8,331,575 155,174,219	15,342,856 188,921,678	26,800,905 180,082,381	28,531,397 196,943,109	12,809,321 92,697,630	20,908,000 132,283,000	224,892,713
Lead	\$ 970,629 kg 3,275,817	4,256,183 12,726,251	20,830,196 59,724,512	29,340,379 98,582,016	34,392,366 101,115,601	38,013,324 106,831,187	41,194,600 90,242,227	54,888,680 122,863,633	15,999,040 32,035,681	46,494,000 67,698,000	266,341,567
Copper	\$ 5,097,157 kg 4,806,718	7,645,623 6,743,140	9,148,995 7,148,616	2,709,696 2,327,836	890,286 792,922	14,791,665 10,517,104	15,571,426 9,111,183	11,928,559 8,487,245	16,045,963 10,642,540	18,062,000 11,793,000	80,183,932
Coal	\$	5,478	9,896	19,074	16,724	17,782	15,447	23,326	9,046	19,950	2,567,132
Zinc	\$ 748,206 kg	5,035,385 14,996,798	24,845,216 70,744,510	39,003,342 105,747,869	45,341,287 107,603,704	61,167,027 114,904,784	60,899,995 79,151,212	95,400,540 115,394,553	39,233,926 47,300,153	81,147,000 105,071,000	348,402,342
Cadmium	\$ 147,716 kg 23,510	234,305 30,922	261,528 33,322	114,654 26,807	22,759 14,837	45,718 5,697	17,331 1,977	15,423 2,050	13,220 2,284	11,000 2,000	6,378,209
Asbestos	\$ 8,684,125 tonnes 57,690	11,924,526 79,321	13,927,652 95,833	12,374,380 83,433	13,006,476 92,431	13,915,140 91,384	22,752,400 82,459	32,820,720 103,735	35,310,723 103,431	37,180,000 102,000	135,872,513
Nickel	\$				3,996,762 1,276,691	5,209,621 1,544,473					9,206,383
Platinum	\$				325,573 112,750	149,458 40,870					475,031
Total	\$ 21,307,955 kg	35,402,563	77,511,933	93,020,402	106,502,067	150,667,311	171,346,288	223,940,346	123,813,268	209,775,000	1,367,426,480

(a) Preliminary Figures (b) Cumulative Totals — 1932 to December 31, 1977 (c) Cumulative Totals — 1886 to December 31, 1977 (d) Figures for years 1932, 1943 to 1953 not available

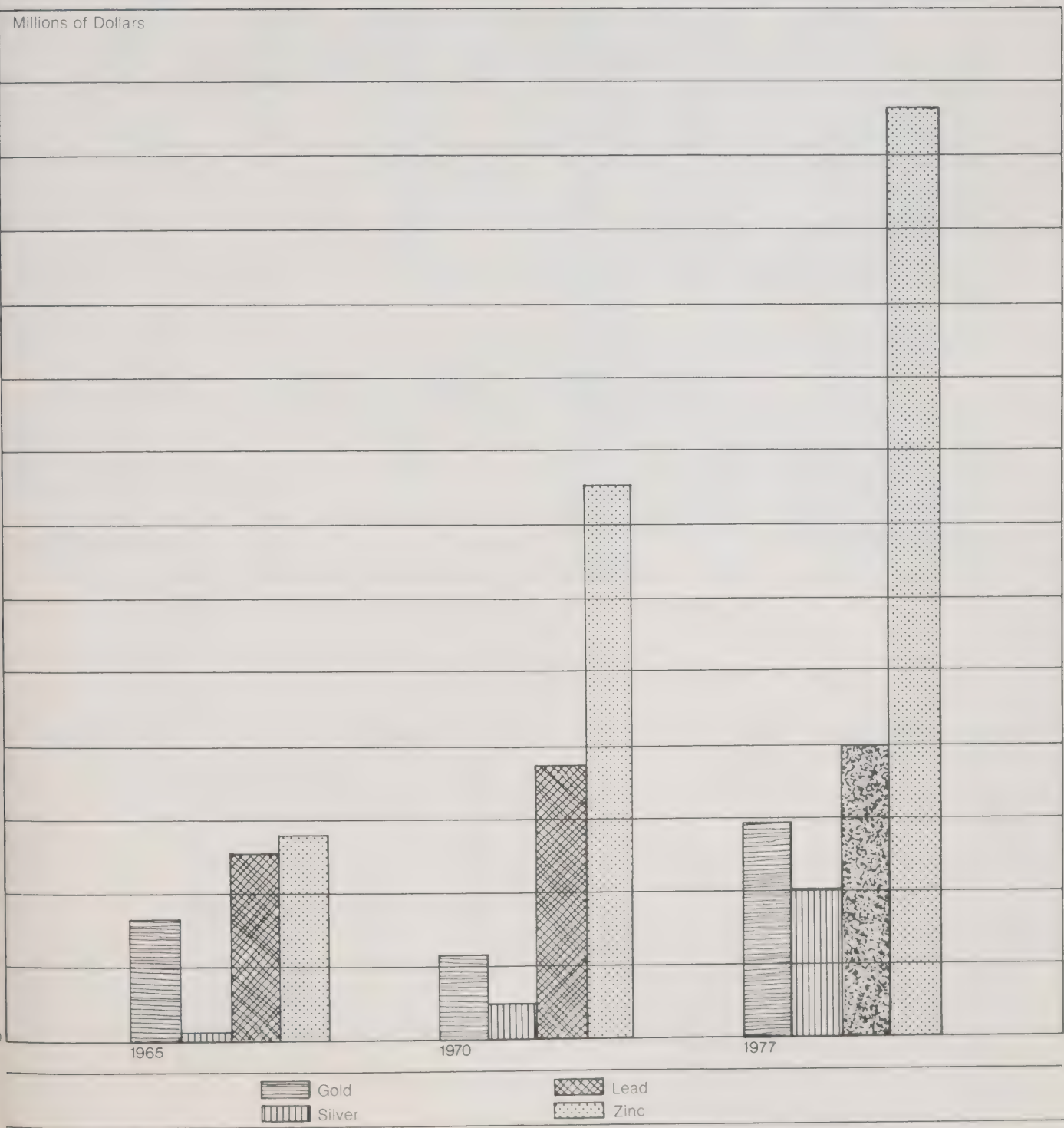
Value of Mineral Production

Yukon Territory



Value of Mineral Production

Northwest Territories



Mining Accident Severities

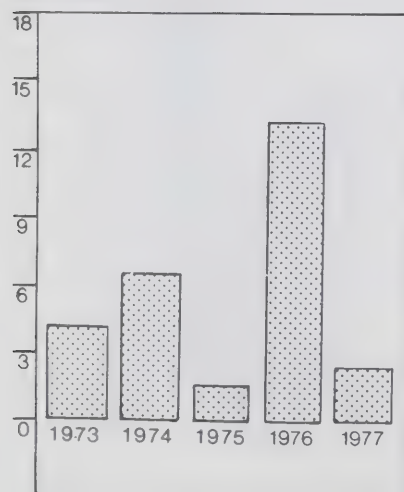
Northwest Territories

Mine	Number of Man/Hrs. Worked 1977	Number of days lost Jan-Dec. 1977	Accident Severity Jan-Dec. 1977	Accident Severity Jan-Dec. 1976
Canada Tungsten Mining Corp. Ltd.	371,604	130	349	18,605
Con-Rycon-Vol	482,429	952	1,973	405
Echo Bay Mines Ltd.	335,082	473	1,412	20,844
Giant Yellowknife Mines Ltd.	638,590	417	653	1,026
Nanisivik Mines Ltd.	451,978	6,324	13,991	—
Northrim Mines Ltd.	33,744	15	445	—
Pine Point Mines Ltd.	1,304,241	236	181	18,017
Terra Mining and Exploration Ltd.	217,825	159	730	28,588
Total	3,835,493	8,706	2,270	13,319

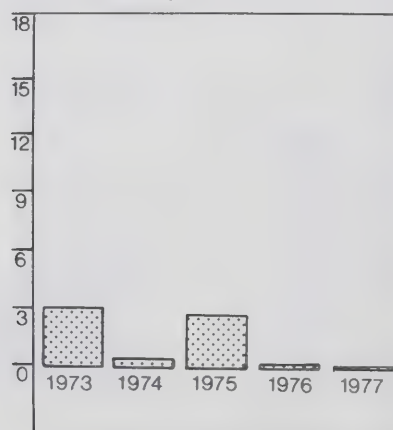
Yukon Territory

Mine	Number of Man/Hrs. Worked 1977	Number of days lost Jan-Dec. 1977	Accident Severity Jan-Dec. 1977	Accident Severity Jan-Dec. 1976
Cyprus Anvil Mining Corp.	1,078,642	113	105	35
Cassiar Asbestos Corp.	663,180	145	219	759
Whitehorse Copper Mines Ltd.	426,066	189	444	383
United Keno Hill Mines Ltd.	546,774	516	944	691
Tantalus Butte Coal Co.	19,171	—	—	227
Total	2,733,833	963	352	471

Northwest Territories



Yukon Territory



Mining Accident Frequencies

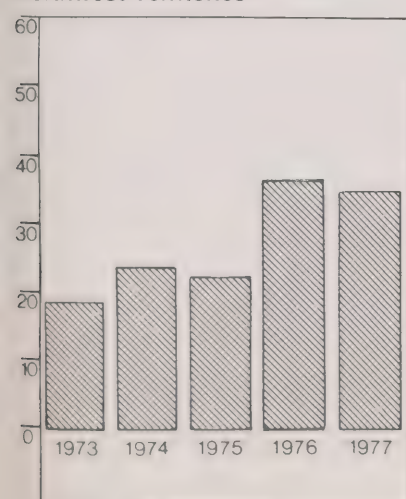
Northwest Territories

Mine	Number of Man/Hrs. Worked 1977	Number of days lost Jan-Dec. 1977	Accident Severity Jan-Dec. 1977	Accident Severity Jan-Dec. 1976
Canada Tungsten Mining Corp. Ltd.	371,604	8	21.52	32.14
Con-Rycon-Vol	482,429	39	80.84	32.36
Echo Bay Mines Ltd.	335,082	31	92.51	107.51
Giant Yellowknife Mines Ltd.	638,590	10	15.66	28.29
Nanisivik Mines Ltd.	451,978	23	50.88	—
Northrim Mines Ltd.	33,744	1	29.63	—
Pine Point Mines Ltd.	1,304,241	5	3.83	8.17
Terra Mining and Exploration Ltd.	217,825	16	73.45	148.07
Total	3,835,493	133	34.68	36.43

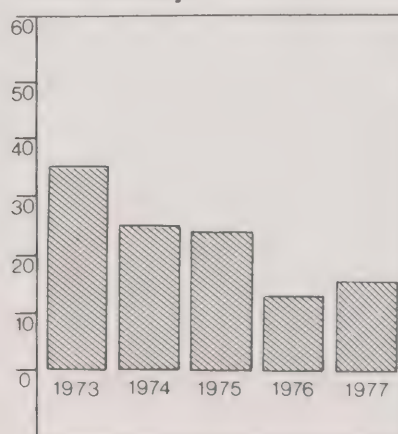
Yukon Territory

Mine	Number of Man/Hrs. Worked 1977	Number of days lost Jan-Dec. 1977	Accident Severity Jan-Dec. 1977	Accident Severity Jan-Dec. 1976
Cyprus Anvil Mining Corp.	1,078,642	8	7.42	8.03
Cassiar Asbestos Corp.	663,180	8	12.06	8.83
Whitehorse Copper Mines Ltd.	426,066	9	21.12	23.78
United Keno Hill Mines Ltd.	546,774	23	42.06	19.26
Tantalus Butte Coal Co.	19,171	—	—	45.30
Total	2,733,833	48	17.58	13.93

Northwest Territories



Yukon Territory



Causes of Disabling Injuries in Mines

	Drilling	Caught between two objects	Strain while lifting	Fall of persons	Struck by moving object	Foreign matter in eyes	Tramming cars	Gassing	Fall of rock	Falling object	Blasting	Burns and Cuts	Miscellaneous	Total
Northwest Territories														
Canada Tungsten Mining Corp. Ltd.	-	1	1	2	-	1	-	-	-	-	-	1	2	8
Con-Rycon-Vol	-	5	13	7	5	1	-	-	4	2	-	1	1	39
Echo Bay Mines Ltd.	-	5	3	6	3	3	-	-	5	2	-	1	3	31
Giant Yellowknife Ltd.	-	1	2	1	2	-	-	-	1	1	-	1	1	10
Nanisivik Mines Ltd.	-	2	2	5	-	1	-	-	-	6	-	4	3	23
Northrim Mines Ltd.	-	-	-	-	-	-	-	-	-	-	-	-	1	1
Pine Point Mines Ltd.	-	2	-	1	-	-	-	-	-	-	-	-	2	5
Terra Mining and Exploration Ltd.	-	-	1	3	3	1	-	-	1	1	-	5	1	16
Total	-	16	22	25	13	7	-	-	11	12	-	13	14	133
Yukon Territory														
Cyprus Anvil Mining Corp.	-	-	2	1	1	-	-	-	-	-	-	3	1	8
Cassiar Asbestos Corp.	-	-	-	4	-	1	-	-	-	-	-	2	1	8
Whitehorse Copper Mines Ltd.	-	-	3	1	1	1	-	-	-	2	-	-	1	9
United Keno Hill Mines Ltd.	-	1	4	8	3	1	-	-	1	3	-	1	1	23
Tantalus Butte Coal Co.	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	-	1	9	14	5	3	-	-	1	5	-	6	4	48



Indian and Northern
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Mines and Minerals Activities 1978

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Northern Affairs Program



Mines and Minerals Activities 1978

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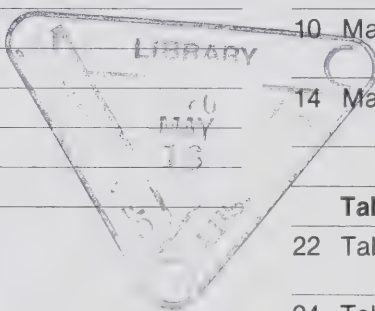
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A definite mood of optimism is evident in mining operations and mineral exploration in the North. High metal prices and improved sales boosted 1978 revenues to record highs in Yukon and Northwest Territories. Mineral exploration and mine development, however, is primarily directed toward discovery of high unit-value metal commodities and/or highgrade mineralization such as lead-zinc, gold, silver, tungsten, molybdenum and uranium. The mining industry in the North operates under distinct disadvantages relative to Southern Canada including remoteness, vastness, severe climatic conditions, lack of electric power and well developed infrastructures and high labour turnover.

In Yukon, mineral production from five mines in 1978 amounted to \$228 million, up \$18.2 million from 1977. Metals accounted for \$195.7 million with zinc the largest revenue producer, followed by lead, silver, copper, gold and cadmium. Asbestos production amounted to \$32.4 million.

Mineral production in the Northwest Territories from eight mines amounted to \$316.5 million in 1978, up approximately \$48.5 million from 1977. Zinc is by far the largest revenue producer followed by lead, gold, tungsten, silver, copper and uranium.

The eleven metal mines in the North amount for 100% of the tungsten, 48.8% of the lead, 28.3% of the zinc, 22.4% of the silver, 13.8% of the gold and 1.7% of the copper production in Canada. In 1978 the Yukon and Northwest Territories accounted for 2.5% of the value of total Canadian mineral production and 7.1% of the value of Canadian metal production.

Key Yukon mining developments during 1978 included:

- i) Acquisition by Cyprus Anvil Mining Corp. of the Grum, Vangorda, Swim lead-zinc deposits from Kerr-Addison Mines Ltd., Canadian Natural Resources and Vangorda Mines Ltd.
- ii) Cessation of underground mining in the Tantalus Butte Coal Mines at Carmacks because of a fire and subsequent total dependence on start-up of open-pit mining.
- iii) Closure in mid-1978 of Clinton Creek open-pit asbestos mine owned by Cassiar Asbestos.

Key developments in Northwest Territories included:

- i) Construction at Canada Tungsten to increase mine and mill production from 453 to 907 tonnes per day.
- ii) Completion of the mile-deep Robertson shaft at Con-Rycon Mines of Cominco.
- iii) Closure of underground mining at Northrim Mines Ltd. silver-copper mine east of Great Bear Lake.

It is also very significant that during 1978 there were no fatal mine accidents in either the Yukon or the Northwest Territories.

Exploration expenditures in Yukon during 1978 amounted to approximately \$18 million and at a similar level to 1977. Claims recorded amounted to 9,549 quartz claims (13,118 in 1977), 1,079 placer claims (834 in 1977), and 222 placer leases (123 in 1977). Prime exploration efforts were focussed on lead-zinc mineralization in the Selwyn Basin in the eastern and southeastern Yukon. Exploration efforts for copper have decreased markedly; however, large corresponding exploration efforts were undertaken for molybdenum, tungsten, uranium and tin. Large drilling programs in excess of 3 000 m (10,000 feet) were undertaken by:

- Cyprus Anvil (6 372 m) for lead-zinc on DY Deposit, Faro Area
- Placer Development (5 459 m) for lead-zinc on ANNIV Deposit, Howards Pass
- Amax Corp. (4 177 m) for tungsten-molybdenum on LOGJAM Deposit
- Placer Development (3 293 m) for tungsten on CLEA-OMO Property

Medium drilling programs of 1 500 to 3 000 m (5,000 – 10,000 feet) were undertaken by:

- Conwest Exploration (2 530 m) for lead-zinc on Sue Property
- Amoco Company Ltd. (1 616 m) for molybdenum on Red Mountain
- Pan Acheron Resources (1 555 m) for lead-zinc
- Cyprus Anvil Corp. (1 536 m) for coal on Tantalus Butte Property

Exploration expenditures in Northwest Territories during 1978 amounted to approximately \$32 to \$35 million. Claim staking resulted in 1,750 claims covering 1 439 845 ha being recorded as opposed to 21,856 claims over 456 870 ha in 1977. Prime exploration efforts were focused on uranium in the Baker Lake – Dubwant Lake, East Arm Great Slave Lake, and Coppermine River areas and probably accounted for three-quarters of the exploration expenditures. Base metals and gold exploration accounted for the majority of the remaining exploration expenditures in the Pine-Point – Mackenzie Mountains, and Yellowknife – Great Bear Lake areas, respectively. Large drilling programs in excess of 3 000 m were undertaken by:

- Western Mines Ltd. (15 244 m) for lead-zinc, Pine Point Area
- Gulf Canada Ltd. (3 616 m) for copper-zinc, Rochon Lake Area
- Urangesellschaft (3 537 m) for uranium, Lone Gull Lake
- Pan Ocean Oil (3 049 m) for uranium, Nutarawit Lake

Many sizeable exploration programs including extensive airborne geophysical surveys, ground reconnaissance and detailed surveys, and many small diamond drilling projects were undertaken.

This report covers mines and minerals activities North of 60° for the year 1978. All aspects of these operations in Yukon and Northwest Territories are administered by the Northern Non-Renewable Resources Branch, Department of Indian and Northern Affairs.

Sections on mineral exploration in Yukon and Northwest Territories were heavily based on papers by D.G. Craig, J.A. Morin, M. Marchand, and W.A. Padgham. This report acknowledges these contributions and contains opinions and interpretations derived from them. Significant contributions were made as to content and form of this report by J.A. Patterson and T.W. Caine, Chief, Mining Division and Evaluation Geologist, respectively, Ottawa.

As of November 1, 1979, the Minister and departmental officers responsible for the administration of mines and mineral resources in the Northwest Territories and Yukon were:

Minister	The Honourable Jake Epp
Deputy Minister	Paul Tellier
Assistant Deputy Minister (Northern Affairs)	E.M.R. Cotterill

Northern Non-Renewable Resources

Ottawa

Director; Northern Non-Renewable Resources:	Dr. W.H. Woodward
Chief, Mining Division:	J.M. Patterson
Head, Mining Resources Section:	A.A. Burgoyne
Evaluation Geologist:	T.W. Caine
Head, Mining Lands Section:	T.W. Dent
Assistant Head, Legislation:	P.M. Corrigan
Assistant Head, Royalties:	(Vacant)

Yukon Region

Director:	D. Watson
Assistant Director:	(Appointment Pending)
Regional Geologist:	(Appointment Pending)
District Geologist:	J.A. Morin
District Geologist:	M. Marchand
Staff Geologist:	R.L. Debicki

Supervising Mining Recorder:	B.R. Baxter
Mining Recorder:	B.E. Sias
Mining Recorder:	D.F. Jennings, Dawson
Mining Recorder:	R.G. Ronaghan, Mayo
Mining Recorder:	V.W. Johanson, Watson Lake

Regional Mining Engineer:	D.B. Stewart
District Mining Engineer:	(Vacant)
Mine Rescue Superintendent:	J. Barraclough
Environmental Technician:	W. Wong
Mining Claim Inspector:	G. Gilbert

Northwest Territories Region

Director:	R.W. Hornal
Assistant Director:	M. Morrisson
Regional Geologist:	W.A. Padgham
District Geologist:	P.J. Laporte
District Geologist:	W.A. Gibbins
District Geologist:	J.M. Seaton
District Geologist:	C.C. Lord
Staff Geologist:	J.A. Goodwin

Supervising Mining Recorder:	R.L. Williams
Mining Recorder:	E.D. Cook
Mining Recorder:	H.B. Mercer

Regional Mining Engineer:	M.L. Brown
District Mining Engineer:	E. Bengts
Mine Rescue Superintendent:	N. Boss
Environmental Technician:	G.E. Ireland
Mining Claim Inspector:	D.G. Irwin

Mining Resources and Mining Geology

The Mining Resources Section in Ottawa maintains a microfilm library on all published geoscientific reports and on all unpublished assessment reports for Yukon and Northwest Territories. This office's prime concern is assessment and definition of mineral potential of specific commodities and areas in the territories relating to proposals concerning parks, land claims, transportation routes, power developments, etc. This section and Mining Division as a whole inform and advise the Minister on current and proposed mine and exploration developments in the North. Monthly and annual reports on Mines and Mineral Statistics and Mines and Mineral Activities, on the North are produced by the Mining Resources Section for use by the mining industry, public and government.

Regional Geologists' offices are maintained at Whitehorse, Yukon and Yellowknife, Northwest Territories. They provide a geological information and advisory service to the mineral industry. Two core libraries, the H.S. Bostock library at Whitehorse and the C.S. Lord library at Yellowknife, provide means for preserving valuable diamond drill core data for the mineral industry. Each has laboratory facilities for core splitting, diamond-saw cutting, thin-section preparation and core storage.

In co-operation with the Geological Survey of Canada, the Yukon Chamber of Mines and the Northwest Territories Chamber of Mines, geoscience forums were held in December 1978 at Whitehorse and Yellowknife. Well attended by the mining and exploration communities, these meetings are held on an annual basis.

Regional and District Geologists carry out mineral property examinations, collect rock and mineral specimens and advise the mineral industry, government departments and research scientists on geological problems arising from their work in the territories. The service includes carrying out geological evaluations on mining developments in the Yukon and Northwest Territories whenever government assistance is requested.

Department geologists assist prospectors and other geologists in identifying rock and mineral specimens by giving prospector training courses, in preparing geological compilation maps on mineralized areas and giving direction when requested.

Mining Lands

The Mining Lands Section in Ottawa develops policies and initiates and assists in drafting appropriate legislation relating to the administration and disposition of mineral rights in the Yukon and Northwest Territories. The section is also responsible for the collection of royalties payable from mining operations in the territories.

For administrative purposes, the territories have been divided into seven mining districts. A mining recording staff is responsible for the disposition of mineral rights within each district in accordance with the applicable legislation. For each territory, there is a Supervising Mining Recorder whose principal function is to ensure that uniform practices are observed in the administration of the various mining acts and regulations.

The districts and location of Mining Recorders Offices are as follows:

Yukon Territory

District	Office
Dawson	Dawson, Y.T.
Mayo	Mayo, Y.T.
Watson Lake	Watson Lake, Y.T.
Whitehorse	Whitehorse, Y.T.

Northwest Territories

District	Office
Mackenzie	Yellowknife, N.W.T.
Nahanni	Yellowknife, N.W.T.
Arctic and Hudson Bay	Yellowknife, N.W.T.

Mining Engineering

This section is responsible for advice regarding the Mining Safety Ordinances and Mining Safety Rules and Regulations in mines as well as the Blasting Ordinance and Regulations in the Yukon and the Explosives Use Ordinance in the Northwest Territories and for amendments and the preparation of new safety legislation when required.

A Regional Mining Engineer is stationed at Whitehorse, Yukon and at Yellowknife, Northwest Territories. He is the Senior Mining Engineer with a staff which includes a District Engineer, Environmental Engineer, Mine Rescue Superintendent, Claims Inspector and clerical staff who are responsible for:

- inspection of mines, quarries and blasting operations to ensure compliance with safety legislation;
- inspection of mineral claims to ensure compliance with the Yukon Quartz Mining Act, the Yukon Placer Mining Act and the Northwest Territories Canada Mining Regulations;
- ensuring that sufficient mine personnel are trained in mine rescue, recovery operations and first aid;

- conducting ventilation and dust surveys, monitoring radioactive contamination, and carrying out environmental studies of all underground and surface mining properties.

Central Mine Rescue Stations are maintained at Whitehorse, Yukon and Yellowknife, Northwest Territories. Substations are established at each mine. The Department now owns over a hundred Drager GB-174 four-hour breathing apparatus. It is the policy of the Department to have a minimum of 12 Drager units at each mine so that the mine rescue team can begin a rescue operation before the arrival of trained personnel from the central station.

Mining Production

The value of mining production sales in the Yukon Territories during 1978 was \$228 million excluding coal and natural gas. Production came from five mines which produced zinc, lead, silver, copper, gold, asbestos, cadmium, and coal. The Yukon accounted for 26.1% of the lead, 12.3% of the silver, 9.5% of the zinc, 1.9% of the gold, and 1.7% of the copper production in Canada. The Cyprus Anvil mine is the first and third largest producer of lead and zinc, respectively, in Canada. In 1978 the Yukon accounted for 1.1% of the value of total Canadian mineral production and for 3.2% of Canadian metal production. See Table I.

The population of the Yukon is about 24,000 with some 1,203 employees or 12.8% of the working force engaged in hardrock mining. The per capita average value of mineral production is \$9,689; the Canadian average is \$837 or \$235 for metals only.

Placer gold mining has been stimulated by the rising price of gold and during 1978, 26,391.37 ounces (820 850.8 grams) were produced from 75 placer operations involving 200 people on a seasonal basis on 5,000 placer claims and 300 leases. The largest gold placer operations are indicated on the Map I, Yukon, Mineral Exploration and Mining.

Unquestionably mining is a major industry and economic stimulator in Yukon, as well as for all of Canada. The location of Yukon mines is given on Map I.

Significant mine developments during 1978 include:

- i) The acquisition by Cyprus Anvil Mining Corp. of six groups of mining claims from Kerr Addison Mines Ltd., Canadian Natural Resources, and Vangorda Mines Ltd. for \$20.6 million; the purchase of these claims and the contained lead-zinc massive sulphide deposits which include the Grum, Vangorda and Swim, assure continued and substantial lead-zinc production from the Faro area well into the twenty-first century;
- ii) Continued exploration and mining of ore deposits by underground and open-pit techniques at United Keno Hill Mines;
- iii) A fire at the Tantalus Butte coal mine at Carmacks in May 1978 caused cessation of underground mining; all subsequent mining has been by open-pit stripping;
- iv) Closure of the Clinton Creek asbestos mine in mid-1978 owned by Cassiar Asbestos northwest of Dawson City.











Cyprus Anvil Mining Corporation

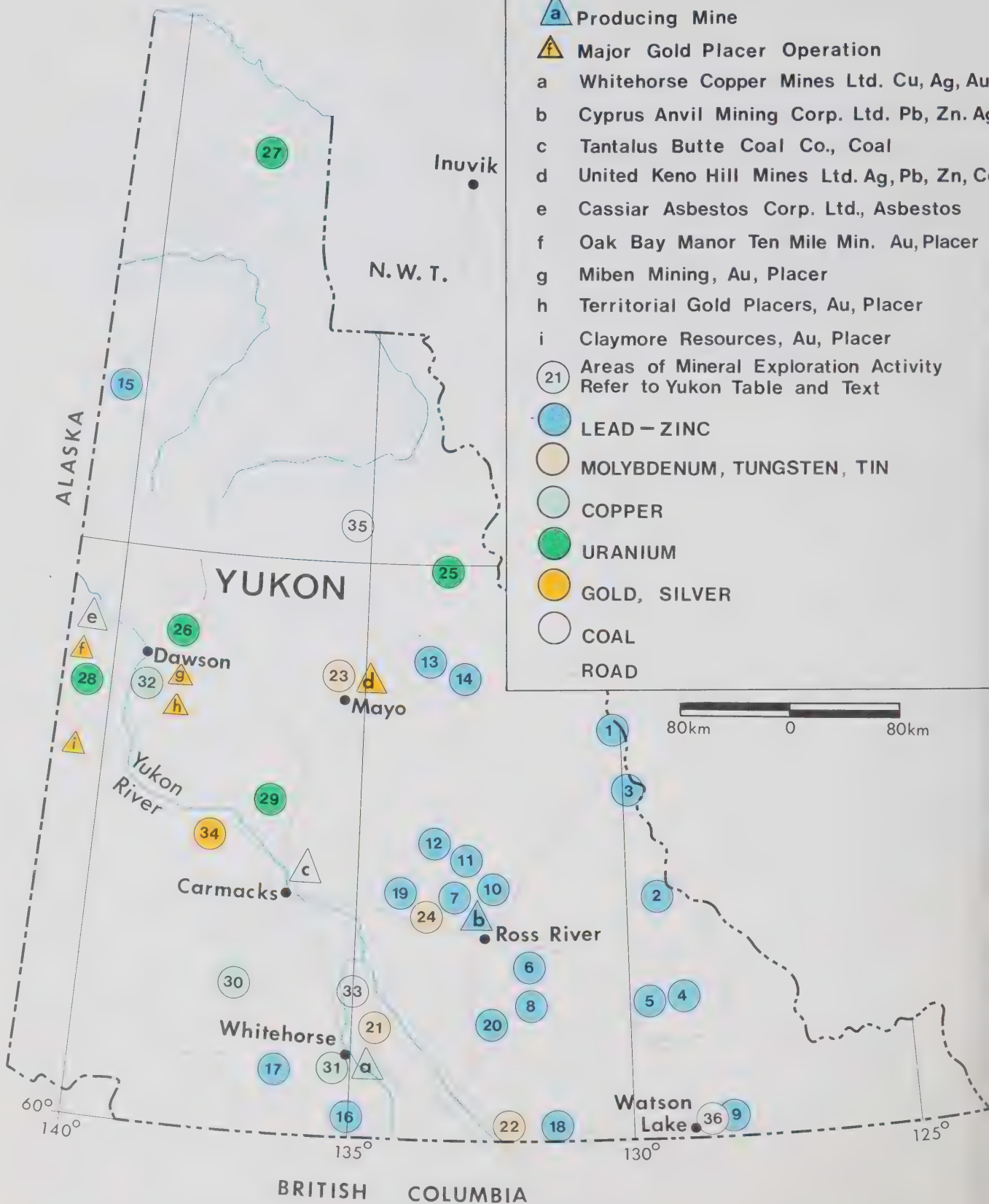
The company increased production of milled tonnes in 1978 to 3 280 000 compared to 3 116 000 tonnes in 1977. Lead and zinc concentrates increased to 134 328 tonnes and 246 375 tonnes compared to 1977 production of 100 390 and 220 831 tonnes, respectively. Extensive deep diamond drilling of 11 holes over 6372 meters were completed on the nearby DY lead-zinc deposit.

Type:	Open-pit
Location:	209 km northeast of Whitehorse
Product:	Zinc, lead, silver, gold
Rate:	9425 tonnes per day
Tonnes Milled:	3 280 000
Reserves	34 200 000 tonnes
Reserve Grade:	3.1% lead, 5.5% zinc, 40 grams silver per tonne
Employees:	526

YUKON MINERAL EXPLORATION AND MINING

LEGEND

-  Producing Mine
-  Major Gold Placer Operation
- a Whitehorse Copper Mines Ltd. Cu, Ag, Au
- b Cyprus Anvil Mining Corp. Ltd. Pb, Zn, Ag
- c Tantalus Butte Coal Co., Coal
- d United Keno Hill Mines Ltd. Ag, Pb, Zn, Cu
- e Cassiar Asbestos Corp. Ltd., Asbestos
- f Oak Bay Manor Ten Mile Min. Au, Placer
- g Miben Mining, Au, Placer
- h Territorial Gold Placers, Au, Placer
- i Claymore Resources, Au, Placer
-  Areas of Mineral Exploration Activity
Refer to Yukon Table and Text
-  LEAD - ZINC
-  MOLYBDENUM, TUNGSTEN, TIN
-  COPPER
-  URANIUM
-  GOLD, SILVER
-  COAL
-  ROAD



United Keno Hill Mines Ltd.

Production came from five underground mines, Husky, Keno, No Cash, Elsa, and Dixie and the open-pit Bermingham mine. The Husky mine contributed 36% of the mill feed and 52% of the silver, whereas the open-pit Bermingham contributed 10% of the mill feed and 3.8% of the silver. Exploration during 1978 discovered three additional veins, the Sime, McLeod and Calumet C structure which can all be developed and mined by open-pit methods.

In 1979 production well also came from new developments in the Ruby Mine. Proven and probable reserves are 223 117 tonnes grading 1050 grams of silver per tonne and 4.9% lead; of these reserves 99 517 tonnes are underground ore (1361 grams silver per tonne, 4.9% lead) and 123 600 tonnes open-pit ore (797 grams silver per tonne, 4.9% lead).

Type:	Underground and open-pit
Location:	50 km northeast of Mayo
Product:	Silver, lead, zinc, cadmium
Rate:	206 tonnes per day
Tonnes Milled:	81 772
Reserves:	223 117 tonnes
Reserve Grade:	1050 grams silver per tonne, 4.9% lead
Employees:	299

Whitehorse Copper Mines Ltd.

Limited exploration continued on the property with little success. The present ore bodies are well defined and without additional ore being discovered, mining operations will possibly cease in 1982.

Type:	Underground
Location:	11 km south of Whitehorse
Product:	Copper, silver, gold
Rate:	2194 tonnes per day
Tonnes Milled:	782 992
Reserves:	2 387 462 tonnes
Grade:	1.57% copper
Employees:	196

Cassiar Asbestos Corporation

This open-pit asbestos mine located at Clinton Creek some 80 km northwest of Dawson City ceased operations in August, 1978 due to depletion of ore. During 1978 the mill handled 3518 tonnes per day and milled a total of 668 352 tonnes of asbestos fibre grading approximately 6%.

Tantalus Butte Coal Co.

Coal from the Tantalus Butte mine is delivered to the Cyprus Anvil mine as a backhaul by trucks that have initially transported lead-zinc concentrates to Whitehorse. The Tantalus Butte is owned by Cyprus Anvil and the coal is utilized for drying lead-zinc concentrates. Coal production during 1978 was reduced by 12% due to fire which closed the underground mining operations in May; all subsequent production has been by open-pit stripping methods. An extensive exploration program involving 31 drill holes over 1536 meters and trenching was completed in order to define additional coal mineralization.

Type:	Open-pit stripping
Location:	Carmacks
Product:	Coal
Rate:	62 tonnes per day
Tonnes Produced:	16 578
Reserves:	Not known
Reserve Grade:	Thermal Coal
Employees:	8

Mineral Exploration

Mineral claims staked and recorded in the Yukon Territory during the year, with comparative figures for 1977 are tabulated below:

District	Claims Recorded	
	1977	1978
Whitehorse	2,630	1,547
Dawson	1,749	1,300
Mayo	2,854	2,704
Watson Lake	5,885	3,998
	13,118	9,549

In addition 1079 placer claims and 222 placer leases were registered; this compares to 1977 figures of 834 and 123, respectively.

Prime exploration efforts were focussed on massive lead-zinc mineralization of the sedimentary-exhalative and volcanogenic types as represented by the Howards Pass/Tom-Jason and Faro area deposits, respectively. Exploration expenditures for copper have decreased markedly; however, large corresponding increases in exploration are being undertaken for molybdenum, tungsten, uranium and tin.

A summary of exploration completed by the various exploration firms are given in Table II. The location of these exploration activities are indicated by a common number on Table II and on Map I, Yukon, Mineral Exploration and Mining.

Lead-Zinc

The Selwyn Basin continued to be an extremely attractive area for lead-zinc exploration. On the eastern side of the Basin several companies including Hudson Bay Expl., Placer Development, Canadian Nickel, Utah Mines, etc. (1-5) were involved in significant exploration programs. The most recent property to receive attention, the MAXI(4), contains concordant lenses and layers of galena-sphalerite in metamorphosed Road River shales. Placer completed a large drilling program on the Howards Pass ANNIV claims. On the eastern edge of the Selwyn Basin significant drill programs have been carried out by St. Joseph Exploration, Cyprus Anvil and Conwest (9, 10, 12). On the MEL property (9) of St. Joseph Exploration, drill indicated reserves are reported at 3.5 million tonnes of 1.93% lead, 5.2% zinc and 61.4% barite; mineralization is contained within a barite horizon localized between Lower Cambrian limestone and Ordovician shale. Cyprus Anvil's (10) main exploration effort in the Faro area was a large drilling program on the DY property testing this volcanogenic lead-zinc deposit at the 600 m depth. Lead-zinc activity also occurred in the Pelly Mountains (7, 8, 19, 20) northwest and southeast of Ross River. In the northern part of the Selwyn Basin Pan Acheron Resources and Prism Resources (13) completed drilling programs on breccia and vein-type lead-zinc-silver deposits, respectively. Iona Silver Mines (20) completed an underground development program on a lead-silver vein system located in the Ketz River valley.

Molybdenum-Tungsten-Tin

Southern and southeastern Yukon was an especially active area for molybdenum, tungsten, and tin exploration; high metal prices and the inherent favourable potential account for the increased activity. Extensive diamond drill programs were con-

ducted by Amoco (21) and Amax (22) on the Red Mountain and LOGJAM properties, respectively. Red Mountain contains a quartz monzonite porphyry stock intrusive into shales and quartzites that hosts vein-stockwork and fracture controlled low-grade molybdenite (0.05-0.15% MoS₂) mineralization. The LOGJAM property on the Yukon - B.C. border contains a large porphyry system containing molybdenite and scheelite; drill indicated reserves are reported at 162 million tonnes grading 0.12% tungsten trioxide and 0.52% molybdenum sulphide. Placer Development and Essex Minerals completed a major exploration and drilling program on the CLEA-OMO property north of Tungsten; here tungsten occurs in a scheelite-bearing calc-silicate skarn at the contact of Paleozoic limestone and a granite stock. Extensive exploration was also undertaken in the Mayo Area (23) by CCH Resources for tin and tungsten mineralization in stock works and fracture fillings. In the Swift River Area (18) Dupont of Canada, Exploration, Duval International Corp, D.C. Syndicate, Amax Minerals Exploration and Welcome North Mines have active exploration programs for tin mineralization within breccia pipes, stockwork veins, and greisen zones within the Seagull Batholith.

Uranium

Uranium exploration increased during 1978 with a considerable number of reconnaissance programs undertaken by Eldorado Nuclear, Cominco, Mattagami Lake Mines, Agip Canada Ltd., Urangesellschaft Canada, Hudson Bay Oil and Gas Co., Union Carbide and E & B Explorations. Property as well as reconnaissance exploration for uranium occurred over many areas of the Yukon in a variety of geological environments. Pan Ocean Oil Limited and Mountaineer Mines Limited completed a drill program on the Loon and Deer claims (25) in the Quartet Lake Area; uranium occurs as brannerite and has secondary uranium minerals within quartz vein swarms and siltstone, respectively. In the Tombstone Mountains (26) Urangesellschaft Canada and Archer, Cathro and Associates carried out exploration surveys; here uranium is found as uraninite within nepheline syenite.

Copper

Copper exploration was significantly reduced in 1978. Whitehorse Copper Mines Limited continued drilling and geophysical programs on its properties in the Whitehorse Copper Belt and on the ACME-HOP claims (31, 30). Riocanex also completed a drilling program on its Lucky Joe (32) prospect south of Dawson City; here low grade copper mineralization is found within quartz mica schist.

Gold

Gold exploration and Placer gold mining has been significantly stimulated by the rising price of gold as indicated in the Mining Production Section on page 9. The largest placer operations are indicated on the Map I, Yukon, Mineral Exploration and Mining.

Coal

Coal exploration has been active in the Watson Lake, Carmacks and Bonnet Plume Basin areas (9, 36, 35). Coal mining by Cyprus Anvil at Carmacks is by open pit methods from the Tantalus Butte Mine; a fire in 1978 caused cessation of all underground mining. Production during 1978 totalled some 16 578 tonnes. Pan Ocean Oil completed an exploration program including drilling on thermal bituminous coal of low ash and sulphur content in the Bonnet Plume Basin. Initial drill results indicate a minimum of three seams ranging from 2 to 9 meters in thickness with potential for very large reserves.



MINERAL EXPLORATION AND MINING

NORTHWEST TERRITORIES



LEGEND



Producing Mines

- a Canada Tungsten Mining Co. Ltd., W, Cu
- b Pine Point Mines Ltd., Pb, Zn
- c Giant Yellowknife Mines Ltd., Au, Ag
Cominco Ltd.(Con-Rycon Mines) Au, Ag
- d Terra Mining & Exploration Ltd., Ag
Northrim Mines, Ag, Cu
- e Echo Bay Mines, Ag, Cu
- f Nanisivik Mines Ltd., Pb, Zn

- 12 Areas of Exploration Activity
Refer to N.W.T. Table and Text

URANIUM

GOLD

LEAD-ZINC

COPPER-ZINC

TUNGSTEN

LITHIUM, DIAMOND



Mining Production

The value of mining production sales in the Northwest Territories during 1978 was \$275 million excluding tungsten, oil and gas. The value of tungsten production in 1978 is estimated at \$41.5 million. Metal production came from eight mines which produced zinc, lead, gold, silver, copper, and tungsten. The N.W.T. accounted for 100% of the tungsten, 22.7% of the lead, 18.8% of the zinc, 11.9% of the gold and 10.1% of the silver production in Canada. The tungsten mine of Canada Tungsten Mining Corp. Ltd. at Cantung will, in mid-1979, at the completion of mine and mill expansion, become the largest single tungsten producer in the western world. Pine Point Mines is the second and third largest producer of zinc and lead, respectively, in Canada. In 1978 the Northwest Territories accounted for 1.9% of the value of total Canadian mineral production (metals, non-metals, structural materials and fuels) and 4.5% of the value of Canadian metal production.

The population of the NWT is about 46,000 with 1,767 employees or 14.7% of the work force engaged in mining. The per capita average value of mineral production is \$7,623; the Canadian average is \$837 or \$235 for metals only. In other Canadian provinces, employees engaged in mining account for 0.6 to 3.5% of the work force.

Unquestionably mining is a major industry and economic stimulator in the NWT as well as for all of Canada.

Significant mine developments during 1978 included:

- i) Construction at Canada Tungsten to increase mine and mill production from 453 to 907 tonnes per day.
- ii) Continued development of open-pit lead-zinc deposits at Pine Point Mines.
- iii) Completion of the mile-deep Robertson shaft at Con-Rycon Mines such that exploration, development and production of deep gold deposits can be done more effectively.
- iv) Continued extensive open-pit mining of gold mineralization at Giant Yellowknife Mines Limited.
- v) Northrim Mines Ltd. located 9 km east of Terra Mining ceased mining and production of silver-copper-bismuth concentrates at the end of May 1978.

Pine Point Mines Ltd.

Ore reserves remain at 34 million tonnes after mining and milling of 2.86 million tonnes in 1978. Production came from eight open pits.

Type:	Open-pit
Location:	South shore of Great Slave Lake, 80 km east of Hay River
Product:	Lead, zinc
Rate:	7853 tonnes per day
Tonnes Milled:	2 859 691
Reserves:	34 019 250 tonnes
Reserve Grade:	2.1% lead, 5.3% zinc
Employees:	572

Nanisivik Mines Ltd.

Lead-zinc concentrates are shipped from Strathcona Sound on Northern Baffin Island to Europe during the short summer season. Nanisivik is the most northerly located mine in Canada.

Type:	Underground
Location:	29 km northeast of Arctic Bay
Product:	Zinc, lead, silver, cadmium
Rate:	1803 tonnes per day
Tonnes Milled:	574 315
Reserves:	5 288 000 tonnes
Reserve Grade:	11.54% zinc, 1.23% lead
Employees:	169

Giant Yellowknife Mines Ltd.

Production during 1978 was obtained largely from the Giant mine although the Lolar and Supercrest mine produced about 10% of the precious metals. Tonnes mined and subsequent gold production was reduced to 2 967 630.54 gams (95,413 ounces) from 1977 production of 3 301 365 grams (106,714 ounces; however, 1978 silver production increased to 770 670.8 grams (24,778 ounces) from 709 428 grams (22,809 ounces). The value of production in 1978 increased to \$22,183,000 from \$17,299,000 in 1977.

Type:	Underground and open-pit
Location:	2.4 km north of Yellowknife
Product:	Gold-silver
Rate:	986 tonnes per day
Tonnes Milled:	359 847
Reserves:	1 103 155 tonnes
Reserve Grade:	9.24 grams gold per tonne
Employees:	340

Cominco Ltd: (Con-Rycon Mines)

The mile deep Robertson shaft was completed during 1978 allowing increased exploration, development, and production from the lower levels of the mine. An extensive underground exploration program was completed in 1978. A record 199 562 tonnes were milled during 1978 compared to 142 697 tonnes in 1977.

Type:	Underground
Location:	2.4 km south of Yellowknife
Product:	Gold-silver
Rate:	550 tonnes per day
Tonnes Milled:	199 567
Reserves:	1 496 880 tonnes
Reserve Grade:	19.53 grams gold per tonne
Employees:	272

Echo Bay Mines Ltd.

Ore production came from the Echo Bay and Eldorado Mines.

Mill tonnage and silver production increased by 10% in 1978 relative to 1977. 1978 production amounted to 73 092 kg (2,350,000 oz.) silver and 234,090 lbs copper).

Type:	Underground
Location:	Port Radium
Product:	Silver, copper
Rate:	95 tonnes per day
Tonnes Milled:	34 232
Reserves:	Not available
Employees:	119

Terra Mining and Exploration Ltd.

Production came from the Silver Bear, North and Norex Mines. The company milled 33 024 tonnes of silver-copper-bismuth mineralization of which 6652 tonnes was from the Norex mine of Norex Resources. Production in 1978 from the Norex property totalled 23 969 kg (770,638 ounces) silver and 16 028 kg copper whereas the Terra properties produced 20 639 kg (663,577 ounces) silver and 21 094 kg copper.

Type:	Underground
Location:	16 km south of Great Bear Lake
Product:	Silver, copper, bismuth
Tonnes Milled:	33 024
Reserves:	Not available
Employees:	53

Northrim Mines Ltd.

This company operated a small underground silver-copper-bismuth mine 9 km east of Terra Mines. Mining ceased in June 1978. 2594 tonnes of mineralization were milled totalling 466.55 kg (15,000 ounces) of silver.

Canada Tungsten Mining Corp. Ltd.

Construction continued toward expansion of mine and mill capacity from 453 to 907 tonnes per day. A record tonnage was milled in 1978.

Type:	Underground
Location:	Tungsten, N.W.T.
Product:	Tungsten
Rate:	486 tonnes per day
Tonnes Milled:	176 668
Reserves:	3 810 156 tonnes
Reserve Grade:	1.55% tungsten trioxide
Employees:	181

Mineral Exploration

Mineral claims staked and recorded in the North-west Territories during the year, with comparative figures for 1977 are tabulated below:

District	Claims Recorded	
	1977*	1978**
Mackenzie	14,351	919
Arctic and Hudson Bay	6,682	794
Nahanni	823	37
	21,856	1,750
Total Area (Hectares)	456 870	1 439 845

* A claim in 1977 was 457.2 meters on the square or 20.9 hectares.
**New staking regulations in 1978 allowed for a claim to vary from 20.9 hectares in equal claim multiples to a maximum of 1045.18 hectares.

The focus of mineral exploration during 1978 in the Northwest Territories was on uranium which absorbed approximately three-quarters of the exploration expenditures of \$32 to \$35 million. Base metals and gold accounted for the majority of the remaining exploration efforts.

Uranium

Uranium exploration was, of course, spurred by the rise in price of uranium, but also on the very favourable geological environment of numerous Proterozoic basins containing sediments that are known on a world-wide basis to host uranium mineralization of several genetic types. Uranium exploration was "Territory-wide" but largely over sedimentary rocks of Proterozoic age. As indicated on Map II of the N.W.T. and Table III, uranium exploration was largely confined to the mainland (again, reflecting geological favourability); some exploration was done on Baffin and Prince of Wales islands. The main centers of uranium exploration being in the following areas:
i) Baker Lake — Dubawnt Lake
ii) East Arm Great Slave Lake
iii) Coppermine River.

Many sizeable exploration programs including extensive airborne geophysical surveys, ground reconnaissance and ground detailed surveys, and diamond drilling were undertaken as indicated on Table III.

The Baker-Dubawnt Lakes areas incurred probably the most sizeable uranium exploration efforts; Urangesellschaft and Pan Ocean Oil completed sizeable diamond drill programs at the Lone Gull Lake (15) and P.O. Lake (19) properties, respectively. Drilling in this area was also undertaken by Noranda, E & B, and Shell Resources.

In the East Arm Great Slave Lake, no less than a dozen exploration programs were completed mostly by major exploration companies. In the Coppermine River area several drilling programs were completed by BP Minerals and Esso Minerals (55, 58).

Lead-Zinc-Copper

Base metal exploration activity was concentrated toward discovery of carbonate hosted lead-zinc mineralization and massive sulphide Cu-Pb-Zn or Pb-Zn in volcanics and/or sedimentary rocks. Exploration for lead-zinc occurred at and peripheral to the Nanisivik and Pine Point Mines (61, 63, 70 to 75) and within the Mackenzie Mountains (77 to 87). Significant exploration and diamond drill programs were conducted in the Nanisivik area (61, 62) and a very large drilling program was completed on the Great Slave Project property of Western Mines (72) west of Pine Point Mines. Pine Point and Cominco staked (71) a large block of ground to the west of Western Mines.

Gulf Canada undertook a large drilling program for Cu-Zn mineralization in the Rochon Lake (59) area whereas Aquitaine and Cominco completed smaller drill programs for similar type mineralization in the McConnell River (60) and on the PALE-MINTO claims (66).

Tungsten, Gold-Silver

Tungsten exploration was directed toward skarn-type mineralization in the Tungsten area (82, 83).

Gold and silver exploration with an emphasis on diamond drilling techniques was quite active on properties of Giant Yellowknife, Cominco (90), Echo Bay (93), and Terra (92) adjacent to the producing mines.

Diamond, Lithium

Diapros Canada Ltd. continued its reconnaissance for diamond-bearing kimberlites (97, 98).

Canadian Superior Exploration Ltd. drilled lithium-bearing pegmatites (43, 99, 90) and have defined reserves and tenor for fourteen properties.

In the Yukon and Northwest Territories the USA standard method of Recording and Measuring Work Injury Experience is used for the mining industry. The following criteria and definitions are used:

- i) In accidents resulting in death, permanent total disability or permanent partial disability, the number of days recorded as lost-time conforms with the time charges set down in the American Standard.
- ii) Disabling injuries are defined by the USA Standard as being those which result in death, permanent total disability, permanent partial disability or temporary total disability.
- iii) Days recorded as lost-time do not include the day of the accident or the day of return to work.
- iv) Accident frequency is expressed as the number of accidents per one million man-hours worked.
- v) Accident severity is expressed as the number of days lost due to accidents per million man-hours worked.

During 1978 in the Yukon there were no fatal mine accidents. There were, however, 101 disabling injuries and the accident frequency was 41.24 as compared to 17.58 in 1977. The accident severity increased from 352 in 1977 to 622 in 1978. The main causes of disabling injuries were "fall of persons" (28), "strain while lifting" (18), "struck by moving object" (11), and "caught between two objects" (11); these four types of disabling injuries accounted for 68 percent of all injuries.

During 1978 in the Northwest Territories there were also no fatal mine accidents. There were, however, 149 disabling injuries and the accident frequency was 40.2, compared to 34.6 in 1977. The accident severity decreased from 2,270 in 1977 to 953 in 1978. The main causes of disabling injuries were "fall of persons" (42), "strain while lifting" (25), "struck by moving objects" (12), "fall of rock" (12), accounting for 61 percent of all injuries.

For the interested reader, detailed tables on "Causes of Disabling Injuries", "Mining Accident Frequencies" and "Mining Accident Severities" have been published in the December 1979, Mines and Minerals Statistics Publication, Indian and Northern Affairs, and are available on request to the Mining Resources Section, Ottawa.

Table I
Mineral Production Chart — 1969 — 1978

Northwest Territories										
Mineral	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978 (a)
Gold g	\$ 12,381,240 10 217 554	12,168,776 10 352 606	10,897,934 9 590 415	17,713,250 9 563 666	24,262,894 7 747 098	28,651,414 5 737 565	28,754,047 5 460 651	24,390,081 6 162 252	31,336,428 6 204 583	44,545,000 6 202 000
Silver g	\$ 3,910,888 63 027 059	5,114,587 85 989 978	4,474,616 91 209 266	6,778,965 126 257 130	13,691,789 168 591 544	17,669,851 118 728 409	8,883,385 61 319 168	14,342,774 103 794 822	18,716,934 118 325 557	24,192,000 122 081 146
Copper kg	\$ 643,761 567 772	766,578 598 970	727,595 625 060	577,416 514 268	1,106,319 786 610	840,719 491 923	526,889 374 885	639,980 424 469	445,850 291 959	520,000 317 000
Nickel kg	\$									
Lead kg	\$ 32,299,014 96 576 048	37,842,405 108 502 061	22,629,795 76 034 832	27,838,277 81 846 189	32,261,787 90 667 291	34,932,761 76 524 844	37,254,292 83 390 558	26,440,157 52 942 453	40,833,313 58 832 599	56,884,000 70 070 940
Zinc kg	\$ 68,275,481 203 343 645	76,004,563 216 416 132	75,056,384 203 496 733	64,792,006 154 103 925	87,541,226 164 449 732	132,251,480 171 886 138	106,650,304 129 002 037	122,438,035 147 610 457	125,104,245 159 709 355	148,786,000 194 171 550
Uranium kg	\$									250
Cadmium kg	\$ 675,136 86 999	737,632 93 984	301,476 70 488	205,436 36 832	61,152 7 620		1,027 137	3,179 549	2,677 386	—
Bismuth kg	\$	3,072 222	41,149 3 437							
Tungsten Kg	\$		1 491 593	1 439 757	1 464 468	1 613 700	1 477 731	2 158 154	2 284 409	
Total	\$ 118,185,520	132,637,613	114,228,949	117,905,350	158,925,167	214,346,225	182,069,944	188,254,206	216,439,447	274,927,000

(a) Preliminary Figures

Yukon Territory

Gold	\$	1,118,715	653,034	511,534	234,983	2,032,502	4,111,631	5,256,077	4,401,075	4,686,115	7,354,200
g		923,213	555,570	450,161	126,871	648,974	823,371	997,986	1,111,949	921,907	1,026,200
Silver	\$	5,182,166	7,845,312	8,966,417	8,331,575	15,342,856	26,800,905	28,531,397	12,839,321	20,154,750	29,436,200
g		83,514,702	131,900,794	178,773,547	155,174,219	188,921,678	180,082,387	196,943,179	92,697,630	121,415,266	149,394,200
Lead	\$	4,256,183	20,830,196	29,340,379	34,392,366	36,013,324	41,494,600	54,888,690	15,993,040	47,427,867	65,456,200
kg		12,726,251	59,724,512	98,582,016	101,115,601	106,831,187	90,242,227	122,863,633	32,035,661	66,621,399	80,442,200
Copper	\$	7,645,623	9,148,995	2,709,696	890,286	14,791,665	15,571,426	11,828,559	16,045,963	5,353,514	13,066,200
kg		6,743,140	7,148,616	2,327,836	792,922	10,517,104	9,111,183	8,457,245	10,842,540	5,843,212	11,212,200
Coal	\$	5,478	9,896	19,074	16,724	17,782	15,447	23,326	9,046		
tonnes											
Zinc	\$	5,035,385	24,845,216	39,003,342	45,341,287	61,167,027	60,899,995	95,400,540	39,233,926	80,562,257	75,431,200
kg		14,936,798	70,744,510	105,747,869	107,603,704	114,904,134	79,151,212	115,394,563	47,300,153	122,846,637	96,505,000
Cadmium	\$	239,965	261,528	114,654	82,759	45,718	17,331	15,423	13,220	11,685	
kg		30,922	33,322	26,807	14,837	5,695	1,977	2,050	1,354	1,670	
Asbestos	\$	11,924,526	13,927,652	12,374,380	13,006,476	13,915,140	22,752,400	32,820,720	26,340,723	47,483,572	32,454,200
tonnes		79,321	95,833	83,433	92,431	91,384	82,459	103,735	103,431	96,600	63,800
Nickel	\$				3,996,762	5,209,621					
kg					1,276,691	1,544,473					
Platinum	\$				325,573	149,458					
g					112,750	40,870					

Total	\$	36,402,563	77,511,933	93,020,402	106,502,067	130,661,311	179,348,786	228,840,396	123,515,268	219,460,113	226,176,200
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(a) Preliminary Figures

Table II
Exploration, Yukon Territory, 1978

Location ¹	Company ²	Property ³ or Area	Mineral- ization ⁴	Diamond Drilling (holes/ meters)	Exploration Surveys ⁵				
					Trenching	Prospecting	Geological Mapping	Geochemistry	Geophysics
1	Hudson Bay Expl	TOM	Pb-Zn-Ag	/587					G
1	Ogilvie J.V.	JASON	Pb-Zn-Ag	X					
1	Canadian Nickel	HASTEN et al	Pb-Zn-Ag	/587					
1	Archer Cathro	ESS	Pb-Zn	X					
2	Placer Development	ANNIV	Pb-Zn	/5459					
3	Cominco		Pb-Zn						
3	Brimex		Pb-Zn						
4	Utah Mines	MAXI	Pb-Zn	X			X		
5	Cominco							X	G
6	Kerr Addison	BLACK	Pb-Zn	X					
6	Pelly Banks Synd.	SHALE-RENO	Pb-Zn	4/229					G
6	Pelly Banks Synd.	EAGLE, FRED	Pb-Zn		X				A
6	Dupont	CZAR, LEACH	Pb-Zn	/305			X		A
7	Welcome North	ANGIE et al	Pb-Zn				X	X	G
7	St. Joseph Expl.	TOM, BOB'	Pb-Zn				X	X	
8	Newmont Expl.	CYR, JOE	Pb-Zn	9/					
9	St. Joseph Expl.	MEL	Pb-Zn-Ba	7/1051					
10	Cyprus Anvil	DY	Pb-Zn-Ag	11/6372					
10	Giant Yellowknife	KD	Pb-Zn	4/					
10	Welcome North Getty Mines						X		G
10	Preussag Canada	CAT	Pb-Zn	2/					
11	Amax-Union Oil						X	X	G
12	Conwest	SUE	Pb-Zn-Ag	17/2530					
13	Pan Acheron Res		Pb-Zn-Ag	22/1555					
13	Prism Res.		Pb-Zn-Ag	X					
14	Dejour Mines	GLEN						X	
15	Rio Alto		Pb-Zn-Ag						
16	D. Lampert S. Pratt	RIDGE	Pb-Zn			X			
17	United Keno Hill		Pb-Zn			X			
18	D.C. Synd.	GULL, SKARN	Zn			X			
19	Welcome North	MAY	Pb-Zn						
20	Iona Silver		Pb-Ag	10/					G
21	Amoco	Red Mountain	Mo	5/1616					G
22	Amax	LOGJAM	Mo, W	19/4177					
3	Placer Development Essex	CLEA, OMO	W	/3293			X		G
23	Canada Tungsten	DUBLIN GULCH	W	X					

24	Risby Tungsten	CAB	W		X	X	X	X	
23	CCH Resources	Mayo Area	W, Sn				X	X	
18	Dupont	Swift R.	Sn			X	X	X	
25	Pan Ocean Oil Mountaineer Mines	LOON, DEER	U	X					
26	Urangesellschaft Archer Cathro	Tombstone Mountains	U		X		X		
27	Aquitaine	Blow R.	U						
16	E&B						X	X	
28	Bethlehem Copper	Matson C.	U						
29	Eldorado Nuclear	Issac C.	U						
30	Whitehorse Copper	ACME-HOP	Cu	4/					G
31	Whitehorse Copper	Whitehorse		4/					G
32	Riocanex	LUCKY JOE	Cu	/762					
32	Ricanex	SPIKE, LIL	Cu						G
33	Loon Lake Synd.	LYNX	Cu		X				
34	Anglo American	SAM	Au-Ag	/490	X				
34	Yukon Revenue	Revenue C.	Au-Ag-W		X				
35	Pan Ocean Oil	Bonnet Plume Basin	Coal	4/			X		
36	Placer Development	Watson C.	Coal	3/416	X				
C	Cyprus Anvil	Tantalus Butte	Coal/pr.	31/1536	X				

Table Footnotes

- (1) Location is made with reference to corresponding TABLE numbers on Map I. Locations are approximate.
- (2) Abbreviated name of the Company is used: J.V. (Joint Venture), Synd. (Syndicate), Expl. (Exploration), Min. (Mining), Dev. (Development), Res. (Resources).
- (3) Geographical areas are indicated by small print, whereas claims and groups are capitalized. Abbreviated words are: Island (I.), Lake (L), Inlet (In.), Creek (C).
- (4) Metal(s) of primary importance defined by chemical symbols: copper (Cu), gold (Au), lead (Pb), lithium (Li), molybdenum (Mo), silver (Ag), tin (Sn), tungsten (W), and uranium (U); other abbreviations include: placer (pl.), production (pr.)
- (5) An X indicates that these particular surveys were done. Diamond core drilling, is predominant, although Locations 23, and 39 on TABLE I are churn and percussion, respectively. Geophysical surveys are differentiated between airborne (A) and ground (G).

Table III
Exploration, Northwest Territories, 1978

Location ¹	Company ²	Property ³ or Area	Mineral- ization ⁴	Exploration Surveys ⁵				
				Diamond Drilling (holes/ meters)	Prospecting	Geological Mapping	Geochemistry	Geophysics
1	Esso Minerals	Cape Dorset	U	/976				
2	Urangesellschaft	Melville Pen.	U		X			A
2	Cominco	Hoppner In.	U		X			A
3	Esso Minerals	Somerset I.	U		X			
4	Esso Minerals	Prince of Wales I.	U		X	X		
5	Cominco	Bathurst In.	U		X	X		A
6	Cominco	Bathurst L.	U					G
7	Essex Minerals	Garry L.	U		X		X	
8	Western Mines	Aberdeen L.	U				X	G
9	Essex Minerals	Schultz L.	U		X	X		
10	Urangesellschaft	Sanhills	U					A
11	Western Mines	Amer L.	U					A
12	Uranerz	Amer L.	U			X		A,G
13	Urangesellschaft	Tehek L.	U					A,G
14	Urangesellschaft	Whitehills	U					A
15	Urangesellschaft	Sandhills	U			X		A
15	Urangesellschaft	Lone Gull, L.	U	37/3537	X	X		
16	Urangesellschaft	Pointer	U					A
17	Esso Resources	Mallery L.	U		X			
18	Comaplex Res. E&B	Thirty Mile L.	U		X			A,G
19	Pan Ocean Oil	P.O. L.	U			X	X	G
19	Pan Ocean Oil	Nutarawit L.	U	42/3049				
20	Pan Ocean Oil	UGL	U			X	X	G
20	Urangesellschaft	UGL	U					A
21	Noranda	Fox-Rax L.	U	X				
21	Essex Minerals	Rak L.	U		X			
22	Esso Resources	Angikuni L.	U		X			
22	Comaplex Res. E&B	Angikuni L.	U		X			A,G
23	Shell Resources	Dubawnt L.	U	10/762		X	X	G
24	Cominco	Angikuni L.	U		X			A
25	Cominco	Nowleye L.	U		X	X		
25	Dolmage Campbell E&B	Nowleye L.	U	X	X			
26	Urangesellschaft	Nowleye L.	U		X	X		G
27	Noranda	Nowleye L.	U	X				
28	Essex Minerals	Nicholson L.	U		X			
29	Urangesellschaft	Thelon R.	U		X		X	
30	Dennison Mines	Bate L.	U		X			
31	PNC Explor	Cullaton L.	U					A,G

32	Sask. Min. Dev.	Scott L.	U				X		
33	Uranertz	Powder L.	U			X	X		
34	PNC Explor	Thekulthili L.	U						
35	Sask. Min. Dev.	Hill Island L.	U			X	X		
36	Sask. Min. Dev.	Thekulthili L.	U						
37	Kelvin Energy						X	X	G,A
38	Giant Yellowknife	Reliance	U			X			
39	Chevron Standard	MacDonald L.	U			X			
40	Seru Nuclear	Pebble I.	U	X					
41	Highwood Res. AAU Synd.	Blanchford L.	U	5/		X			
42	B. Rossing	McKinley Point	U			X			
43	Pacific Copper	Buckham L.	U						A
44	Rayrock Res.		U				X		A
45	Eldorado Nuclear Esso Minerals		U					X	
45	Eldorado Nuclear Esso Minerals	MAG	U			X	X		
46	Noranda Expl.	Faber L.	U	1/					
47	Chevron Standard	WOP	U				X	X	
48	Major Resources		U	X					
49	Hudson Bay Oil & Gas		U				X		G
50	BP Minerals	Beep L.	U				X		
51	BP Minerals		U				X		G
52	BP Minerals		U				X		G
53	Uranerz		U				X		A,G
54	Hudson Bay Oil & Gas		U				X		G
55	BP Minerals	LAC, JEN	U	17/					
55	BP Minerals	PAT	U	2/					
56	Gulf Minerals		U				X	X	G
57	Hudson Bay Oil & Gas		U				X		G
58	BP Minerals	TIM, JEFF	U	10/					
58	Esso Minerals	YUK-ML	U	20/					
59	Gulf Canada	Rochon L.	Cu-Zn	32/3616			X		G
60	Aquitaine	McConnel R.	Cu-Zn	6/762					
61	Shell Canada Res.	TR	Pb-Zn	X		X	X		G
62	Nanisivik		Pb-Zn	X					
63	Canadian Superior	Cornwallis I.	Pb-Zn				X		
64	Texasgulf		Cu-Zn			X	X	X	G
65	Texasgulf		Cu-Zn			X	X	X	G
65	Hudson Bay Oil & Gas	KEY, HOK SOL, JAN	Cu-Zn	7/					
66	Cominco	PALE, MINOV	Cu-Zn	3/1006				X	
67	Getty Minerals	Aylmer L.	Cu-Zn						
68	St. Joseph Expl.	Victory L.	Cu-Zn	X					
69	B. Rossing	Thubun L.				X			
70	Pine Point Mines	Pine Point	Pb-Zn						
71	Pine Point/Cominco		Pb-Zn						
72	Western Mines		Pb-Zn	/15244					
73	Gulf Minerals	Heart L.	Pb-Zn	1/610					
74	Pine Point Mines	Windy Point	Pb-Zn						G
75	Cominco	QUITO	Pb-Zn						G



Table III
Exploration, Northwest Territories, 1978 (con't)

Location ¹	Company ²	Property ³ or Area	Mineral- ization ⁴	Diamond Drilling (holes/ meters)	Exploration Surveys ⁵			
					Prospecting	Geological Mapping	Geochemistry	Geophysics
76	Giant Yellowknife	Wrigley	Pb-Zn		X			
77	Welcome North	Skinboat L.			X	X		
77	St. Joseph Expl.	Skinboat L.	Pb-Zn		X			
78	Nahanni Placers Cambria Expl.		Pb-Zn		X		X	
79	Hudson Bay Mining & Smelting	MacMillan L.	Pb-Zn		X			
80	Welcome North	Glacier L.	Pb-Zn		X	X		
81	Welcome North	S. Nahanni R.	Pb-Zn		X	X		
82	Canada Tungsten	Tungsten	W	X				
83	Union Carbide	NIP	W	X		X	X	
84	Placer Devel. Essex Minerals	Howards Pass XY, OP	Pb-Zn	X				
85	Hudson Bay Mining	MacMillan Pass	Pb-Zn		X			
86	Canico		Cu(?)		X	X	X	
87	Rio Canex	RT, Gayna R.	Pb-Zn		X	X		G
88	Keewatin Joint Venture	Turquetil L.	Au	6/				
89	O'Brian Energy	Cullaton L.	Au					G
68	Strike Lake Res.	JOON	Au					
90	Cominco	KAMEX	Au	9/				
90	Giant Yellowknife	Supercrest	Au	X				
90	Giant Yellowknife	Northbelt	Au	4/				
90	Giant Yellowknife	Lynx	Au	6/				
90	Giant Yellowknife	YT	Au	3/				
91	Perry River Nickel	TONY, BLAKE	Au	X			X	G
91	Noranda	BUD et al	Au-Ag	13/				
48	Sunshine Mining	LEAH-GOSSAN	Ag-Au	9/				
92	Echo Bay Mines	CBB, LEN, PAUL	Ag	19/				
92	Terra Mining	Norex Prop.	Ag	10/				
93	Echo Bay Mines	Eldorado Mine	Ag	X				
93	Echo Bay Mines	St. PAUL, BONANZA	Ag	26/				
94	E. Linberg	Liard R.	Placer Au		X			
95	E. Linberg	Liard R.	Placer Au		X			
96	R. Turner	Spruce L.	Ag		X			
97	Diapros Canada	Pond. In.	Diamond		X	X		
98	Diapros Canada	Holman I.	Diamond		X	X		
43	Canadian Superior	THOR,	Li	6/				
99	Canadian Superior	VOL, KI	Li	5/				
90	Canadian Superior	NITE	Li	1/				G

(1) (2) (3) (4) (5) Footnotes — see TABLE II



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Northern Mineral Advisory Committee

Effective communications and dialogue and improved relations between government and industry concerning mining exploration and development in the North were highlighted in 1979 by several meetings of the Northern Mineral Advisory Committee across Canada and by submission of their final report to the Honourable Jake Epp, Minister of DIAND in August 1979.

The Northern Mineral Advisory Committee concept was presented to DIAND through a joint initiative of the Northwest Territories Chamber of Mines, the Yukon Chamber of Mines, the Alberta Chamber of Resources, the B.C. and Yukon Chamber of Mines, and the Mining Association of Canada. Industry's main desire for formation of the Committee was the perceived tendency of DIAND to downgrade resource development in northern policy-making, and with the need to provide the Minister with more valuable information for balanced development decisions. The Honourable J. Hugh Faulkner, then Minister of DIAND responded positively to the initiative and agreed to a committee composed of government and the mineral Industry.

Seven industry representatives from the above organizations and eight officials from various federal and territorial departments were appointed by the Minister. Mr. John Bruk, President of Cyprus Anvil Mining Corp. was elected chairman. The Minister also agreed to the appointing of a senior mining advisor to his office. On the recommendations of the industry members of the Committee, Mr. William T. Irvine was duly appointed for a six month term as special mining advisor and also as executive secretary to the Committee.

The Committee met on seven occasions; twice in Vancouver and Ottawa, and once in Edmonton, Whitehorse and Yellowknife. The Committee appeared before the Parliamentary Standing Committee on Indian Affairs and Northern Development in Ottawa on March 15, 1979. The work of the Committee was augmented by two subcommittees, one on land use and one on fiscal policy.

The purpose of formation of the Committee was to assist and advise the Minister of Indian Affairs and Northern Development in formulating policies and strategies for mining in the Yukon and Northwest Territories. The following mineral policy elements were presented to the Minister of DIAND in March 1979.

1. Major Role of Non-Renewable Resources in Northern Development
2. Continued Government Consultation with Mining Industry
3. Secure Mineral Tenure
4. Access to Mineral Rights
5. Balance Between Development and Environment
6. Incentives for Northern Mining Commensurate with Risks
7. Participation by Northern Residents to be Encouraged
8. Infrastructure Development with Government Assistance.

On August 30, 1979 in Ottawa the Committee presented their comprehensive final report on the above mineral policy steps, to the Honourable Jake Epp, then Minister of Indian Affairs and Northern Development.

Since submission of this report, the Minister and his staff have been reviewing, in depth, the recommendations with the object of implementing, where appropriate, amendments to current legislation and changes to northern mineral policy.

This report is available to the interested reader upon request, however, the Northern Mineral Advisory Committee recommendations are summarized as follows.

1. Reorganize DIAND to provide mining expertise at the executive policy making level.
2. Appoint a new Advisory Committee.

3. Facilitate the exploration and development of non-renewable resources by:
 - i) independent review of proposed limitations on mineral activity;
 - ii) modifying content and administration of land use regulations;
 - iii) examining the Thelon Game Sanctuary with view to allowing mineral exploration and development.
4. Through better communications encourage northern residents to participate in mineral development.
5. Encourage new mine development through infrastructure support.
6. Amend mineral legislation
 - i) Yukon Quartz Mining Act — to improve provisions respecting the title of mineral claims
 - ii) Territorial Coal Regulations — to comprehensively amend as soon as possible.
7. Provide financial incentives for northern mining:
 - i) corporate taxation
 - ii) royalty regime
 - iii) prospectors and related individuals
 - iv) provisions for northern residents

A high mood of optimism is evident in mining operations and mineral exploration in the North. Record high base and precious metal prices boosted 1979 revenues to record highs in Yukon and Northwest Territories. Mineral exploration and mine development has historically been primarily directed toward discovery of high unit-value metal mineralization; however, with increased metal prices many previous marginally and subeconomic deposits have become economically viable and several mine development/production announcement have been made.

The value of mining production sales in the Yukon Territory during 1979 was \$299 564 000 excluding coal and natural gas. Zinc was the largest revenue producer followed closely by lead and more distant by silver, copper, and gold. Metal production came from three mines Cyprus Anvil, United Keno Hill, and Whitehorse Copper. Coal was produced by the Tantalus Butte Mining Company. Placer gold mining has been stimulated by the rising price of gold and during 1979 export royalties were paid on 34,074 ounces (1 090 906 grams), up 36% from 1978. Production is from 90 placer operations involving 400 people on a seasonal basis.

The Yukon accounted for 26% of the lead, 11.1% of the silver, 10.3% of the zinc, 1.6% of the gold, and 1.2% of the copper production in Canada. In 1979 the Yukon accounted for 1.15% of the value of total Canadian mineral production and for 3.75% of Canadian metal production.

The value of metal mining production in the Northwest Territories during 1979 was \$369 117 000, excluding tungsten. The value of tungsten produced in 1979 is estimated at approximately \$50 000 000. Metal production came from seven mines which include Pine Point and Nanisivik (lead-zinc), Giant Yellowknife and Cominco (gold-silver), Echo Bay and Terra (silver-copper) and Canada Tungsten (tungsten). Zinc was the largest revenue producer followed by lead, gold, tungsten, silver, and copper.

The N.W.T. accounted for almost 100 percent of the tungsten, 17.5 percent of the lead, 18.7 percent of the zinc, 19.8 percent of the gold, and 6.8 percent of the silver production in Canada. In 1979 the Northwest Territories accounted for 1.6 percent of the value of total Canadian mineral production (metals, non-metals, structural materials and fuels) and 4.6 percent of Canadian metal production.

The following Key developments occurred in the Yukon during 1979:

- i) Preliminary engineering and development studies were undertaken by Cyprus Anvil Mines Ltd. to bring into production massive sulphide lead-zinc deposits in the Faro area.
- ii) The dramatic increase in the price of silver allowed United Keno Hill Mines to significantly increase reserves and production of open-pit silver-lead, ore.
- iii) United Keno Hill completed an underground development and drilling exploration program on the Venus Mine, a gold-silver-lead vein deposit located near Carcross.
- iv) Amax completed underground development and bulk sampling of the Mactung tungsten property at MacMillan Pass.
- v) Vein deposits of argentiferous galena in several areas of the Yukon were subjected to underground development, and exploration and/or high-grade mining operations.
- vi) Several companies rapidly expanded gold placer mining operations in Klondike and adjacent areas. Several significant placer mining developments are scheduled for 1979-80 and include those by Cosaga Mining, Copperfields Mining, Queenstake Resources and Canada Tungsten Mining.

The following Key developments occurred in the N.W.T. during 1979:

- i) Cominco announced that its subsidiary, Arvik Mines Ltd., will bring to production the lead-zinc Polaris deposit, located on Little Cornwallis Island in the Arctic, by 1982 at an estimated capital cost of \$150 million.

- ii) O'Brien Energy Resources/Consolidated Durham Mines and Resources announced that it will bring to production the Selco B gold deposit, located at Cullaton Lake, in late 1981 at a capital cost of \$16 million.
- iii) Noranda Mines Ltd. announced it will bring to production the Camlaren gold mine, located at Gordon Lake, by 1981 at an estimated capital cost of \$4.5 million.
- iv) Echo Bay Mines undertook a \$6 000 000 underground exploration and development program at the Lupin gold property at Contwoyto Lake; a production decision is anticipated in early 1980.
- v) Cadillac Explorations announced that the Prairie Creek silver-lead vein deposits will be brought to production at a capital cost of \$35 million in late 1981.
- vi) Canada Tungsten Mines completed a mine/mill expansion program at the tungsten mine and have doubled production to 900 tonnes per day.
- vii) Pine Point Mines completed erection of a \$21 million drag line for overburden removal during open-pit mining operations.
- viii) Western Mines continued with a large development and exploration drilling program on their lead-zinc deposits in the Pine Point area.
- ix) Terra Mining and Exploration located on the east shore of Great Bear Lake continued exploration and development for silver mineralization at its Silver Bear Mine and on the Terra-Norex Joint Venture property.

Yukon exploration activity continued at a good pace in 1979 with exploration expenditures of \$20 million up 10-15% from 1978. Exploration projects in 1979 were heavily directed toward discovery and definition of base metal mineralization. The search for stratabound shale-hosted and vein-type lead-zinc-(silver) mineralization accounted for about 40 percent of exploration expenditures; skarn, tungsten-tin and copper and porphyry molybdenum-(tungsten) accounted for a further 33 percent. The search for uranium, gold, coal and asbestos in decreasing order, account for the remaining expenditures.

The following significant exploration developments and discoveries occurred in 1979:

- i) Conwest Exploration and Essex Minerals announced the discovery of the Clear Lake lead-zinc deposit, 96 km northwest of Faro.
- ii) Pan Ocean Oil defined a large coal deposit in excess of 380 million tonnes in the Bonnet Plume Basin of Northern Yukon.
- iii) Amoco Petroleum have defined a large porphyry molybdenum deposit, known as Red Mountain, 80 km northeast of Whitehorse.
- iv) Prism Resources in the Kathleen Lake area north of Mayo announced the discovery of several significant silver-lead zinc vein deposits.

As an indicator of the magnitude of exploration activity in Yukon, the following large drilling programs in excess of 3 000 meters (9840 feet) were carried out:

- Cyprus Anvil Mining Co. (15 244 m) on DY, Vangorda and other lead-zinc deposits in Faro area.
- Amoco Co. Ltd. (6 707 m) on Red Mountain molybdenum deposit.
- Pan Ocean Oil Co. Ltd. (4 420 m) on Bonnet Plume Basin coal deposits.
- Placer Development Co. Ltd. (3 659 m) on Howards Pass lead-zinc deposits.
- Prism Resources Ltd. (3 115 m) on Val silver-lead-zinc deposit.
- St. Joseph Explorations Ltd. (3 004 m) on Mel lead-zinc barite deposit.

In addition, a further twelve medium-sized drilling programs in excess of 1 400 meters (4 600 feet) but less than 3 000 meters were also completed.

In the Northwest Territories exploration activity continued at a good pace in 1979 with exploration expenditures similar to that in 1978 of \$32 to \$35 million. As in 1978 exploration projects were heavily directed toward discovery and definition of uranium mineralization which absorbed some 75 percent of all exploration expenditures. However, with the recent rapid increases of metal prices, significant exploration efforts were directed toward base/previous metals.

Uranium exploration continued largely in Proterozoic basins containing sediments and meta-sediments that are known to host several styles of uranium deposits including the unconformity vein-type. The main areas where exploration activity were decreased include: Baker Lake-Dubawnt Lake, Coppermine River-Dismal and Hornby Lakes, Nonacho Lakes, and Bathurst Inlet.

The search for base metals was carried out in five distinct geographical/geological areas of the Northwest Territories which include: Arctic Islands (lead-zinc); Ennadi volcanic belt (copper-zinc); Pine Point (lead-zinc); Slave Province (copper-zinc); and Mackenzie Mountains (lead-zinc, tungsten).

Precious metal exploration was concentrated in the Cullaton Lake, Contwoyto-Bathurst Inlet, Yellowknife and Great Bear Lake areas.

As an indication of the magnitude of exploration activity in the Northwest Territories, the following large drilling programs in excess of 3 000 meters were carried out:

- Pine Point Mines Ltd. (52 353 m) on and adjacent to producing lead-zinc deposits.
- Western Mines Ltd. (24 003 m) on X-25 and R-190 lead-zinc deposits.
- Giant Yellowknife Mines Ltd. (11 665 m) at their producing gold mine.
- Nanisivik Mines Ltd. (8 439 m) on producing Strathcona Sound lead-zinc deposit.
- Union Carbide Canada Ltd. (6 069 m) on Lened tungsten deposit.
- Cominco Ltd. (5 893 m) on lead-zinc properties near Hay River.
- Urangesellschaft Canada Ltd. (4 641 m) on Sissons Lake uranium property.
- B.P. Minerals Ltd. (4 610 m) on uranium properties in the Coppermine area.
- Pan Ocean Oil Ltd. (3 631 m) on Yathkyed Lake uranium property.
- Uranerz Exploration Ltd. (3 051 m) on uranium property near Powder Lake.

In addition a further eight medium sized drilling programs in excess of 1 400 meters but less than 3 000 meters were also completed.

Introduction

This report covers mines and minerals activities North of 60° for the year 1979. All aspects of these operations in Yukon and Northwest Territories are administered by Northern Non-Renewable Resources Branches, Department of Indian and Northern Affairs.

Sections on mineral exploration in Yukon and were heavily based on papers by J.A. Morin, and M. Marchand, and in the Northwest Territories by W.A. Padgham, W.A. Gibbins, P.J. Laporte, C.C. Lord, and J.B. Seaton. This writer acknowledges these contributions but takes sole responsibility for opinions and interpretations made therefrom and given in this report.

As of March 3, 1980, the Minister and departmental officers responsible for the administration of mines and mineral resources in the Northwest Territories and Yukon were:

Minister	Hon. John C. Munro
Deputy Minister	Paul Tellier
Assistant Deputy Minister (Northern Affairs)	E.M.R. Cotterill

Ottawa

Director; Northern Non-Renewable Resources Branch:	Dr. H.W. Woodward
Chief, Mining Division:	J.M. Patterson
Head, Mining Resources Section:	A.A. Burgoyne
Evaluation Geologist:	T.W. Caine
Head, Mining Lands Section:	T.W. Dent
Assistant Head, Legislation:	P.M. Corrigan
Assistant Head, Royalties:	Vacant

Yukon Region

Regional Director:	D. Watson
Assistant Director:	Appointment Pending
Regional Geologist:	D. Tempelman-Kluit
District Geologist:	J.A. Morin
District Geologist:	Vacant
Staff Geologist:	R.L. Debicki
Supervising Mining Recorder:	B.R. Baxter
Mining Recorder:	B.E. Sias, Whitehorse
Mining Recorder:	D.F. Jennings, Dawson
Mining Recorder:	R.G. Ronaghan, Mayo
Mining Recorder:	V.W. Johanson, Watson Lake
Regional Mining Engineer:	D.B. Stewart
District Mining Engineer:	Vacant
Mine Rescue Superintendent:	J. Barraclough
Environmental Technician:	W. Wong
Mining Claim Inspector:	G. Gilbert

Northwest Territories Region

Regional Director	R.W. Hornal
Assistant Director:	M. Morrisson
Regional Geologist:	W.A. Padgham
District Geologist:	P.J. Laporte
District Geologist:	W.A. Gibbins
District Geologist:	J.M. Seaton
District Geologist:	C.C. Lord
Staff Geologist:	J.A. Goodwin

Supervising Mining Recorder:	R.L. Williams
Mining Recorder:	E.D. Cook
Mining Recorder:	H.B. Mercer

Regional Mining Engineer:	M.L. Brown
District Mining Engineer:	E. Bengts
Mine Rescue Superintendent:	N. Boss
Environmental Technician:	Vacant
Mining Claim Inspector:	D.G. Irwin

Mining Resources and Exploration and Geological Services

The Mining Resources Section in Ottawa maintains a microfilm library on all published geoscientific reports and on all unpublished assessment reports for Yukon and Northwest Territories. This office's prime concern is assessment and definition of mineral potential of specific commodities and areas in the territories relating to proposals concerning parks, land claims, transportation routes, power developments, etc. This section and Mining Division as a whole inform and advise the Minister on current and proposed mine and exploration developments in the North. Monthly and annual reports on Mines and Mineral Statistics and Mines and Mineral Activities, are produced by the Mining Resources Section for use by the mining industry, public and government.

Regional Geologists' offices are maintained at Whitehorse, Yukon and Yellowknife, Northwest Territories. They provide a geological information and advisory service to the mineral industry. Two core libraries, the H.S. Bostock library at Whitehorse and the C.S. Lord library at Yellowknife, provide means for preserving valuable diamond drill core data for the mineral industry. Each has laboratory facilities for core splitting, diamond-saw cutting, thin-section preparation and core storage.

In co-operation with the Geological Survey of Canada, the Yukon Chamber of Mines and the Northwest Territories Chamber of Mines, geo-science forums were held in December 1979 at Whitehorse and Yellowknife. Well attended by the mining and exploration communities, these meetings are held on an annual basis.

Regional and District Geologists carry out mineral property examinations, collect rock and mineral specimens and advise the mineral industry, government departments and research scientists on geological problems arising from their work in the territories. The service includes carrying out geological evaluations on mining developments in the Yukon and Northwest Territories whenever government assistance is requested.

Departmental geologists assist prospectors and other geologists in identifying rock and mineral specimens by giving prospector training courses, in preparing geological compilation maps on mineralized areas and giving direction when requested.

Mining Lands

The Mining Lands Section in Ottawa develops policies and initiates and assists in drafting appropriate legislation relating to the administration and disposition of mineral rights in the Yukon and Northwest Territories. The section is also responsible for the collection of royalties payable from mining operations in the territories.

For administrative purposes, the territories have been divided into seven mining districts. A mining recording staff is responsible for the disposition of mineral rights within each district in accordance with the applicable legislation. Each territory has a Supervising Mining Recorder whose principal function is to ensure that uniform practices are observed in the administration of the various mining acts and regulations.

The districts and location of Mining Recorders Offices are as follows:

	District	Office
Yukon Territory	Dawson	Dawson, Y.T.
	Mayo	Mayo, Y.T.
	Watson Lake	Watson Lake, Y.T.
	Whitehorse	Whitehorse, Y.T.
Northwest Territories	Mackenzie	Yellowknife, N.W.T.
	Nahanni	Yellowknife, N.W.T.
	Arctic and Hudson Bay	Yellowknife, N.W.T.

Mining Engineering

This section is responsible for advice regarding the Mining Safety Ordinances and Mining Safety Rules and Regulations in mines as well as the Blasting Ordinance and Regulations in the Yukon and the Explosives Use Ordinance in the Northwest Territories and for amendments and the preparation of new safety legislation when required.

A Regional Mining Engineer is stationed at Whitehorse, Yukon and at Yellowknife, Northwest Territories. He is the Senior Mining Engineer with a staff which includes a District Engineer, Environmental Engineer, Mine Rescue Superintendent, Claims Inspector and clerical staff who are responsible for:

- inspection of mines, quarries and blasting operations to ensure compliance with safety legislation;
- inspection of mineral claims to ensure compliance with the Yukon Quartz Mining Act, the Yukon Placer Mining Act and the Northwest Territories Canada Mining Regulations;
- ensuring that sufficient mine personnel are trained in mine rescue, recovery operations and first aid;

- conducting ventilation and dust surveys, monitoring radioactive contamination, and carrying out environmental studies of all underground and surface mining properties.

Central Mine Rescue Stations are maintained at Whitehorse, Yukon and Yellowknife, Northwest Territories. Substations are established at each mine. The Department now owns over a hundred Drager GB-174 four-hour breathing apparatus. It is the policy of the Department to have a minimum of 12 Drager units at each mine so that the mine rescue team can begin a rescue operation before the arrival of trained personnel from the central station.

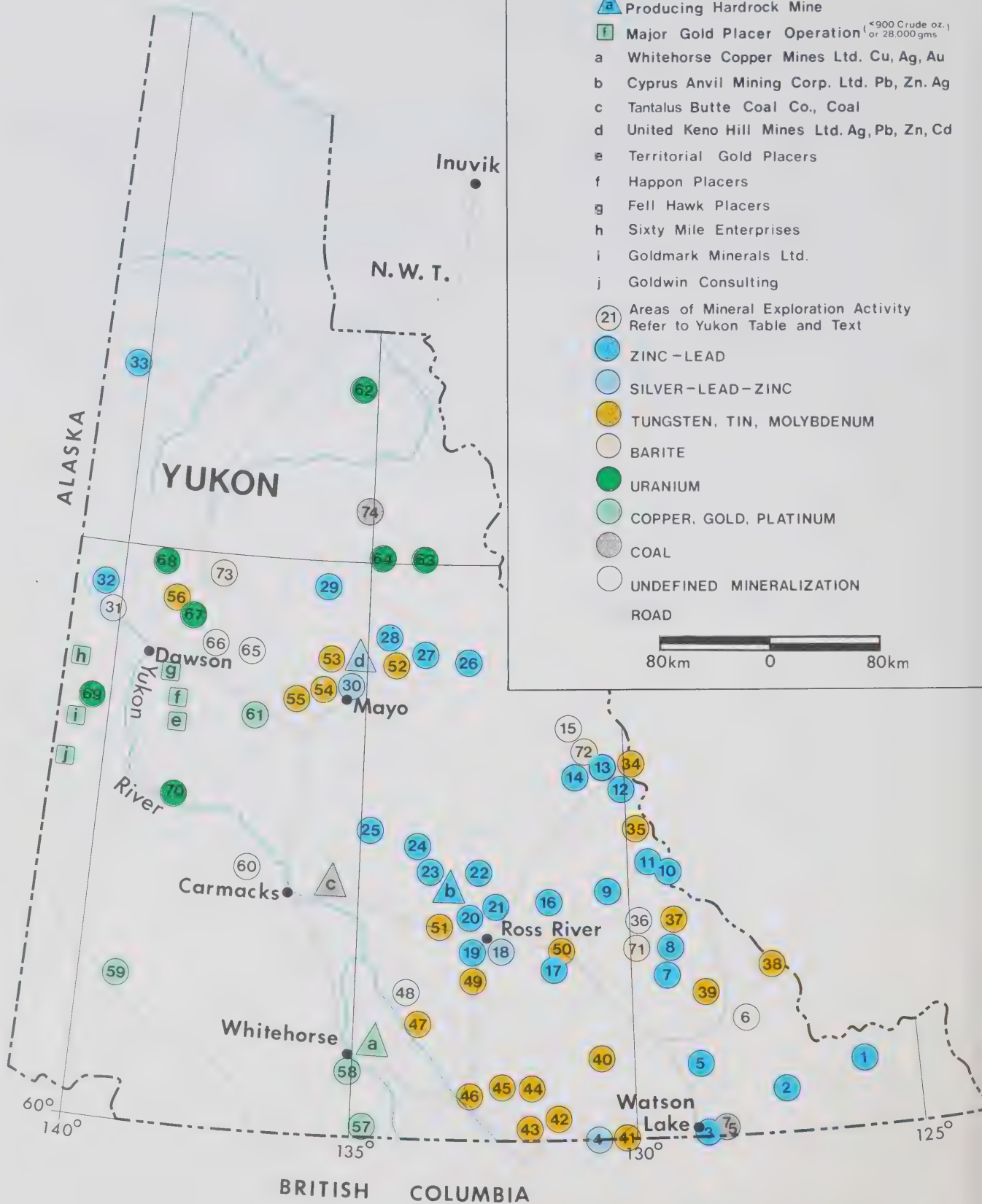
YUKON MINERAL EXPLORATION AND MINING - 1979

LEGEND

- Producing Hardrock Mine
- Major Gold Placer Operation (^{<900 Crude oz.}
or 28,000 gms)
- a Whitehorse Copper Mines Ltd. Cu, Ag, Au
- b Cyprus Anvil Mining Corp. Ltd. Pb, Zn, Ag
- c Tantalus Butte Coal Co., Coal
- d United Keno Hill Mines Ltd. Ag, Pb, Zn, Cd
- e Territorial Gold Placers
- f Happon Placers
- g Fell Hawk Placers
- h Sixty Mile Enterprises
- i Goldmark Minerals Ltd.
- j Goldwin Consulting
- (21) Areas of Mineral Exploration Activity
Refer to Yukon Table and Text
- ZINC - LEAD
- SILVER - LEAD - ZINC
- TUNGSTEN, TIN, MOLYBDENUM
- BARITE
- URANIUM
- COPPER, GOLD, PLATINUM
- COAL
- UNDEFINED MINERALIZATION

ROAD

80km 0 80km



Mining Production and Development

The value of mining production sales in the Yukon Territory during 1978 was \$299 564 000 excluding coal and natural gas. Production came from four mines Cyprus Anvil, United Keno Hill, Whitehorse Copper and Tantalus Butte which produced zinc, lead, silver, copper, gold, cadmium, and coal. The Yukon accounted for 26% of the lead, 11.1% of the silver, 10.3% of the zinc, 1.6% of the gold, and 1.2% of the copper production in Canada. The Cyprus Anvil mine is the first and third largest producer of lead and zinc, respectively, in Canada. In 1979 the Yukon accounted for 1.15% of the value of total Canadian mineral production and for 3.75% of Canadian metal production.

The population of the Yukon is about 24,000 with some 1150 employees or 11% of the working force engaged in hardrock mining.

Placer gold mining has been stimulated by the rising price of gold and during 1979 export royalties were paid on 35,074 ounces (1 090 906 grams), up 36% from 1978. Production is from 90 placer operations involving 400 people on a seasonal basis on 6905 placer claims and 570 leases.

The following key developments occurred in the Yukon during 1979:

- i) Preliminary studies were begun by Cyprus Anvil Mines Ltd., to examine the development of the additional massive sulphide lead-zinc deposits of Swim, Grum, and Vangorda, recently acquired from Kerr Addison, Mines Ltd., Canadian Natural Resources, and Vangorda Mines Ltd. It is estimated that the first phase of development of these new deposits will cost \$50 to \$60 million; during 1979 some \$22 million was spent on exploration development, and engineering studies. Extensive modifications to the mill grinding circuit, more transportation studies and additional power will be necessary; engineering to modify the Anvil concentrator or to accommodate the new ores is underway. With the acquisition of these deposits and the newly (1976) discovered DY deposit, Cyprus Anvil now has ore reserves for another 30 to 50 years of operation. A single housing subdivision at Faro estimated to cost \$6.1 million will proceed in 1980.
- ii) The dramatic increase in the price of silver has allowed United Keno Hill Mines to significantly increase mined and milled tonnage of lower grade open-pit ore. Significant additional reserves have been defined and open-pit ore accounted for 45 percent of tonnage supplied to the mill in 1979.
- iii) United Keno Hill completed a \$500 000 underground development and drilling exploration program of 295 metres of drifting and 1378 metres of drilling over 27 holes on the Venus Mine, a gold-silver-lead vein deposit located near Carcross. Results to date have been encouraging and a production decision will probably be reached in 1980. Proven and probable reserves are reported at 70 400 tonnes grading 9.2 grams gold per tonne, 246 grams silver per tonne, 2.1% lead, and 1.4% zinc.
- iv) Vein deposits of argentiferous galena were subjected to underground development and exploration and/or high-grade mining operations.
 - a) Iona Silver Mines Ltd. continued their underground development program on silver-lead veins of the Ketzia River property some 50 km south of Ross River.
 - b) Silver Arrow Mines mined some 1000 tonnes of high-grade silver-lead mineralization from the old Canol Mine Property, 50 km south of Ross River.
 - c) Klondike Silver Mines mined 17.2 tonnes of high-grade silver-lead-zinc mineralization from the Freer Creek property on the Yukon - B.C. Border, 100 km west of Watson Lake.
- v) Several companies have been rapidly expanding gold placer mining operations. It is reported that over 250 pieces of earth moving equipment were at work in the 1979 season in the Klondike-Sixty Mile area. Most operators utilize conventional stripping/sluicing techniques, however, few including Cogasa Mining have begun to use patented gold/heavy mineral recovery plants. Key placer mining developments for 1979-1980:

- a) Cosaga Mining has invested some \$5.5 million over the last four years on development of a plant for recovery of gold. Currently one such plant is in operation in the Sixty Mile River area; four similar plants each at a capitalization of \$3 million are being planned for the Forty Mile, Sixty Mile, and Indian Rivers.
- b) Copperfields Mining Corporation, a subsidiary of Tech Corporation plans to spend in the order of \$1.5 million in the Klondike and process 2 300 000 cubic metres over 10 years; initial production in 1980 will be 93 300 to 125 000 grams (3000-4000 oz.) with the possibility this will be expanded in subsequent years.
- c) Queenstake Resources will reactivate an old dredge at a cost of \$2 million and plans to operate for 10 years in the Clear Creek Area.
- d) Canada Tungsten Mining Corp. operated a pilot plant during 1979 at Dublin Gulch for recovery of gold, tin, and tungsten. In 1980 some 150 000 to 190 000 cubic metres of gravels will be processed.

Cyprus Anvil Mining Corporation

The company milled 2 823 060 tonnes in 1979 to produce 222 073 tonnes of zinc concentrate (50.38% zinc), 117 491 tonnes lead concentrate (61.3% lead) and 28 631 tonnes of mixed lead/zinc concentrate (45.24% combined lead-zinc); these figures represent a decrease of 10% for zinc and 13% for lead production compared to 1978 which was caused, in part, by a strike from September 17 to October 5, 1979. The company completed preliminary engineering studies for modification of the mill to accommodate new ores from adjacent massive sulphide deposits.

Type:	Open-pit
Location:	209 km northwest of Whitehorse
Product:	Zinc, lead, silver, gold
Rate:	8057 tonnes per day
Tonnes Milled:	2 823 060
* Reserves:	39 800 000 tonnes
Reserve Grade:	3.0% lead, 4.8% zinc, 37 grams silver per tonne
Employees:	581

*These reserves include only the Faro deposits; of this total geological reserve, 32 million tonnes at an average grade of 3.1% lead, 4.8% zinc and 37 grams silver per tonne, are contained within the present open-pit operating plan. Large reserves also occur in adjacent deposits including DY, Vangorda, Grum and Swim.

United Keno Hill Mines Ltd.

The company continued to produce silver-lead from five underground mines, Jusky, Keno, No Cash, Ruby, and Elsa and the open-pit Sime and Bermingham mines. Lower grade open-pit ore in 1979 accounted for 48% of tonnage supplied to the mill and 36% of silver produced. In 1979 a total of 112 785 tonnes of ore were processed through the mill; metal production amounted to 77 178 kilogram silver and 2 549 244 kilograms lead. Silver and lead production declined by 9.4% and 25%, respectively. Ore reserves include: 184 238 tonnes of underground ore grading 1132 grams per tonne silver and 4.3% lead; open-pit reserves of 43 870 tonnes grading 920 grams silver per tonne; and ore in stockpile at 71 845 tonnes grading 694 grams silver per tonne and 3.8% lead. Reserves were increased in all underground mines; the open-pit Bermingham mine was exhausted in October 1979. Significant new tonnage was defined on the newly defined South-West Husky Vein and further exploration is planned in 1980.

Type:	Underground and open-pit
Location:	50 km northeast of Mayo
Product:	Silver, lead
Rate:	409 tonnes per day
Tonnes Milled:	112 785
Reserves:	299,953 tonnes
Reserves Grade:	995 grams silver per tonne 4.3% lead
Employees:	303

Whitehorse Copper Mines Ltd.

The company continued to mine lower grade copper mineralization from its underground operations near Whitehorse. Approximately 25% of the operation's revenue comes from gold and silver. Although reserves are only sufficient to keep the mine operating until late 1982, improvements in mining methods have allowed the processing of lower grade ore and with a discovery from continued surface and underground exploration, it is possible that the mining may continue to late 1983 or 1984.

Type:	Underground
Location:	11 km south of Whitehorse
Product:	Copper, gold, silver
Rate:	2284 tonnes per day
Tonnes Milled:	829 235
Reserves:	2 097 050 tonnes
Grade:	1.12% copper
Employees:	204

A total of 7 933 803 kg of copper, 5 255.5 kg silver and 493 542 grams gold were produced.

Tantalus Butte Coal Co.

The company commenced open-pit stripping operations in May and production ceased in late June. Coal from the mine is delivered to the Cyprus Anvil mine as a backhaul by trucks that have initially transported lead-zinc concentrate to Whitehorse. The Tantalus Butte Coal mine is owned by Cyprus Anvil Mines and the coal is utilized for drying lead-zinc concentrates. Coal production during 1979 increased to 23 000 tonnes, up 39% from 1978. Approximately 3.33 tonnes of waste are removed for each tonne of coal recovered.

Type:	Open-pit stripping
Location:	Carmacks
Product:	Sub Bituminous Coal
Rate:	Approximately 470 tonnes per day for 49 operating days
Tonnes Produced:	23 003
Reserves:	Not available
Employees:	18 (seasonal basis)

Mineral Exploration

Mineral claims staked and recorded in the Yukon Territory during the year, with comparative figures for 1978 and 1977 are tabulated below:

Districts	Claims Recorded		
	1977	1978	1979
Whitehorse	2 630	1 547	1 942
Dawson	1 749	1 300	2 175
Mayo	2 854	2 704	3 197
Watson Lake	5 885	3 998	4 012
	13 118	9 549	11 326

In addition 2479 placer claims and 446 placer leases largely in the Dawson District were registered; this compares to 1978 figures of 1079 and 222, respectively.

Exploration activity continued at a good pace in 1979 with exploration expenditures of \$20 million up 10-15% relative to 1978. Exploration projects in 1979 were heavily directed toward discovery and definition of base metal mineralization. The search for stratabound shale-hosted and vein-type lead-zinc (silver) mineralization accounted for about 40 percent of exploration expenditures; that for skarn tungsten-tin and copper and porphyry molybdenum-(tungsten) accounted for a further 33 percent. Uranium, gold, coal and asbestos in decreasing order, account for the remaining expenditures.

The following key developments occurred in the Yukon during 1979:

- i) Conwest Exploration and Essex Minerals announced the discovery of the Clear Lake lead-zinc deposit, located some 80 kilometers northwest of Faro.
- ii) Pan Ocean Oil has defined a large coal deposit in excess of 380 million tonnes in the Bonnet Plume Basin of Northern Yukon. Studies are now being made on the feasibility of constructing an open pit mine and thermal plant for generation of hydroelectric power.
- iii) Amoco Petroleums have defined a large (in excess of 100 million tonnes) porphyry molybdenum deposit, known as Red Mountain, 80 km northeast of Whitehorse.
- v) Prism Resources in the Kathleen Lakes area north of Mayo have announced the discovery of several significant silver-lead-zinc vein deposits.

A summary of exploration completed by the various exploration and mining firms is given in Table II. The location of these exploration activities are given a common number on Table II and illustrated on the map, Yukon Mineral Exploration and Mining, 1979.

Lead-zinc-(Silver)

The Selwyn Basin within Eastern Yukon continued to be an extremely attractive area for lead-zinc-(silver) exploration. In the Watson Lake area (1-8) several companies including St. Joseph Explorations, Cima Resources, Sovereign Metals, and Utah Mines completed sizeable programs including drilling. On the Mel (3) property, St. Joseph Explorations completed 3004 meters of diamond drilling over 12 holes; reserves are reported at 4.8 million tonnes of 2.05% lead, 5.6% zinc and 52.1% barium sulphate. On the Maxi property (8), Utah Mines completed 1463 meters of drilling over 11 holes.

In the MacMillan Pass — Howards Pass area (10-15) sizeable exploration and drilling programs were undertaken on shale-hosted lead-zinc deposits. Placer Development at Howards Pass (10) completed 3659 meters of drilling and are planning to go underground in 1980. Hudson Bay Explorations has extended the mineralized zone at the Tom (12) by 2296 meters of drilling over 15 holes and plan underground development in 1980; Pan Ocean Oil on the adjacent Jason deposit completed 2043 meters of drilling.

In the Ross River — Faro area (16-25) Welcome North, Getty Mines, Amax Potash, Cyprus Anvil and Conwest Explorations/Essex Minerals completed sizeable exploration programs. Iona Silver Mines on their Katza River deposit (18) completed underground development work. Welcome North on the Ruth (22) drilled a single hole to a depth of 1244 meters and completed further drilling on the Rachel and Sunset properties. Cyprus Anvil completed 15 244 meters of diamond drilling utilizing five diamond drills on the Dy, Vangorda and other lead-zinc properties in the Faro mining district (23); much of this drilling (exclusive of that done on Dy) is directed toward development and engineering studies in respect to bringing the Vangorda, Grum and Swim massive sulphide deposits to production in the early 1980's. Conwest Explorations in a joint venture with Essex Minerals announced a major massive sulphide lead-zinc barite discovery at Clear Lake (25); one 10 meter intersection yielded 18.27% zinc, 2.15% lead and 64.7 grams silver per tonne; some 2482 meter of drilling over 10 holes was completed in 1979.

In the Mayo area (30) United Keno Hill continued extensive overburden drilling programs over and adjacent to their producing silver-lead-zinc vein deposits. In the Kathleen Lakes area (27-28) some 80 kilometers northeast of Keno Hill, Prism Resources undertook an extensive exploration and drilling program to discover and define silver-lead-zinc mineralization in veins and brecciated dolomite; some 6363 meters of diamond drilling was completed over the Val, Vera, Zap and Dee properties.

Tin-Tungsten-Molybdenum-Copper

In the MacMillian Pass-Howards Pass (34-37) area exploration continued for tungsten; Amax completed bulk sampling and 1773 meters of drilling over 15 holes at the MacTung deposit; Placer Development completed further drilling totalling 1281 meters over 8 holes on the Clea property; Rio Canex also completed a drilling programs on the Woah property.

In the Rancheria-Swift River area (41-46) tin and tungsten were the cause of much exploration activity. Most programs were not drilling oriented but concentrated on reconnaissance and detailed surveys to define mineralization. Numerous showings have been located of tin-tungsten skarns, tin-bearing griesens and tin-bearing quartz vein stockworks. Companies active in this area include D.C. Syndicate, DuPont of Canada and Amax. At the Logtung molybdenum-tungsten porphyry deposit (43) Amax released reserve and grade estimates of 161 million tonnes grading 0.12% tungsten tri-oxide and 0.05 molybdenite.

At the Red Mountain molybdenum porphyry deposit (47), Amoco Canada Petroleum continued a major deep drilling program to define a large deposit; one of the best intersections returned 108 meters of 0.31% molybdenite. A total of 6707 meters of diamond drilling over 15 holes was completed.

In the area south and east of Ross River exploration was carried out by several companies for tungsten — skarn mineralization. Hudson Bay Mining and Exploration completed 1626 meters of diamond drilling over 16 holes on the Risby tungsten deposit (51). On the Boot property (50) Archer Cathro completed 1414 meters of diamond drilling over 10 holes.

In the Mayo area tin and tungsten, both hardrock and placer, were responsible for much activity. Canada Tungsten explored for tin in quartz veins and in breccias in Dublin Gulch (53); and for tungsten in the Potato Hills. Canada Tungsten also set up a pilot plant placer operation to recover gold, tungsten and tin from gravels in Dublin Gulch. CCH Resources drilled a tin-silver prospect (54) and Cominco in limited drilling encountered low grade tungsten and gold mineralization in amphibolitic skarn on Scheelite Dome and low grade tin in the Sunshine Creek area (55).

Uranium

Uranium exploration was mainly confined to the Tombstone and Wernecke Mountains. Extensive surveys including drilling were completed by several companies on properties in the Tombstone Mountains; the larger programs were carried out by Archer Cathro (67) on the Ting property (1775 meters of diamond drilling over 17 drill holes) and by Eldorado Nuclear on the Jove property (945 meters of drilling over 7 holes). In the Wernecke Mountains (63-64) Pan Ocean Oil drilled 1549 meters over 17 holes on the Kiwi Lake property (Deer) and 608 meters on the Otter property near Fairchild Lake. On the Deer, secondary uranium occurs in shear zones in Proterozoic siltstone whereas at the Otter uranium (brannerite) is found in fractures in diatreme breccia bodies and adjacent argillite country rocks. The Igor, a uranium prospect, similar geologically to the Otter was drilled by Archer Cathro.



MINERAL EXPLORATION AND MINING NORTHWEST TERRITORIES — 1979

100km 0 100km

LEGEND

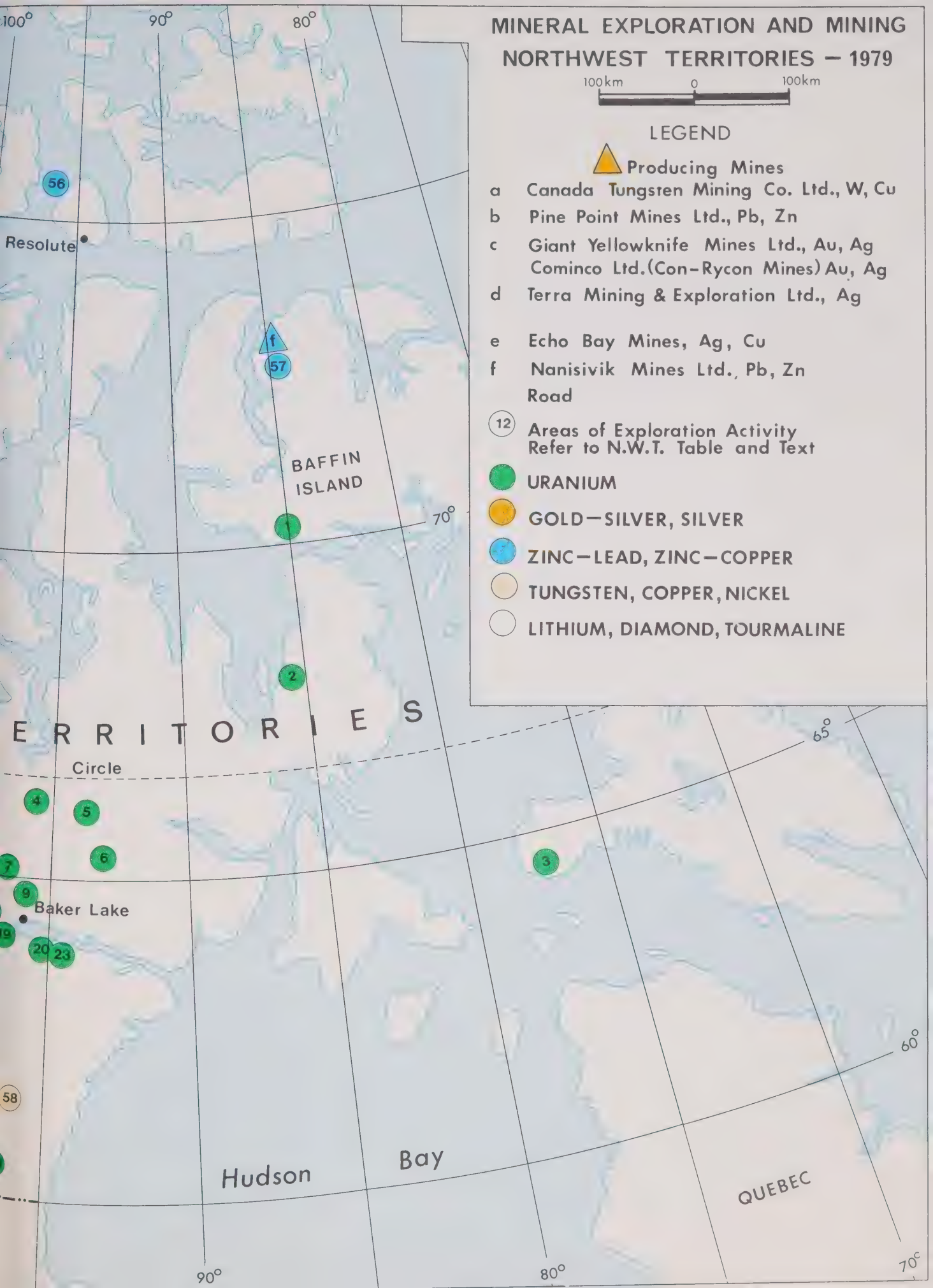


Producing Mines

- a Canada Tungsten Mining Co. Ltd., W, Cu
- b Pine Point Mines Ltd., Pb, Zn
- c Giant Yellowknife Mines Ltd., Au, Ag
Cominco Ltd.(Con-Rycon Mines) Au, Ag
- d Terra Mining & Exploration Ltd., Ag
- e Echo Bay Mines, Ag, Cu
- f Nanisivik Mines Ltd., Pb, Zn
Road

- (12) Areas of Exploration Activity
Refer to N.W.T. Table and Text

- URANIUM
- GOLD—SILVER, SILVER
- ZINC—LEAD, ZINC—COPPER
- TUNGSTEN, COPPER, NICKEL
- LITHIUM, DIAMOND, TOURMALINE



Gold-Copper

United Keno Hill Mines completed underground exploration and development work on the Venus gold-silver mine located near Carcross (57) and a production decision is anticipated in the spring of 1980. Proven and probable reserves are previously reported at 70 400 tonnes grading 9.2 grams gold per tonne, 246 grams silver per tonne, 2.18% lead, and 1.4% zinc.

The only significant exploration carried out for copper was in the Whitehorse Copper District (58) where Whitehorse Copper Mines drilled several properties adjacent and distant from the producing mine in the search for skarn-type copper-gold mineralization.

Placer gold exploration was focussed largely in the Klondike (Dawson) area and during 1979 several exploration and development projects were undertaken and/or announced. Details are given in the Mining Production and Development Section.

Barite

Barite is used largely as a drilling mud and weighting agent to hold drill rods in-situ during deep drilling for oil and gas. Barite used for this purpose must equal or exceed 4.2 specific (93% barium sulfate) gravity and meet other specification defined by the American Petroleum Institute (API). Several deposits were worked on during 1979 and were either solely barite or barite associated with lead-zinc mineralization.

The lead-zinc-barite Mel deposit (3), discussed earlier, if brought to production will require upgrading of the current barite content from 52.1% to an acceptable API grade. The Tan property near Frances Lake (71) is owned by Sovereign Metals Corporation and contains a series of barite veins with an average 1.52 meter width; during 1979 trenching and geological mapping were completed. North of MacMillian Pass the Cathy-Lorraine property (72) of NL Baroid contains bedded barite within a sedimentary package of Lower to Middle Palaeozoic age; minor diamond drilling was completed during 1979. The Rein barite (73) deposits of Union Miniere Explorations and Mining Corp. are located just east of the Dempster Highway; massive bedded barite deposits are contained within shale and argillites of mid-Palaeozoic age; limited trenching and drilling was completed during 1979.

Coal

In the Bonnet Plume Basin (74) some 140 km north of Mayo, Pan Ocean Oil completed a major diamond drill program (4420 meters over 17 holes) to define a large subbituminous coal field within Cretaceous sediments containing high quality thermal coal seams in sufficient quantity to support a mine-mouth electric power development. Measured, indicated and inferred on sites, reserves in excess of 380 million tonnes have been established in four deposit areas.

Placer Development completed exploration and drilling programs (1000 meters) on their coal seams near Watson Lake (75).

Mining Production and Development

The value of metal mining production in the Northwest Territories during 1979 was \$369 117 000, excluding tungsten. The value of tungsten produced in 1979 is estimated at approximately \$50 000 000. Metal production came from seven mines which include Pine Point and Nanisivik (lead-zinc), Giant Yellowknife and Cominco (gold-silver), Echo Bay and Terra (silver-copper), and Canada Tungsten (tungsten).

The N.W.T. accounted for almost 100 percent of the tungsten, 17.5 percent of the lead, 18.7 percent of the zinc, 10.8 percent of the gold, and 6.8 percent of the silver production in Canada.

In 1979 the Northwest Territories accounted for 1.6 percent of the value of total Canadian mineral production (metals, non-metals, structural materials and fuels) and 4.6 percent of Canadian metal production.

The population of the N.W.T. is about 46,000 with 1822 employees or 14.4% of the work force engaged in mining.

The following significant developments occurred during 1979:

- i) Cominco in November 1979 announced that its subsidiary, Arvik Mines Ltd., will bring to production by 1982 the lead-zinc Polaris deposit, located on Little Cornwallis Island in the Arctic, at an estimated capital cost of \$150 million; the mine will employ 250 people and have an annual payroll of \$4.5 million; the mill will process some 2 000 tonnes of ore per day. Reserves are 22.7 million tonnes grading 14.1% zinc and 4.3% lead.
- ii) O'Brien Energy and Resources in a joint venture with Consolidated Durham Mines and Resources have announced that they will bring to production the Selco B gold deposit, located at Cullaton Lake 700 km east of Yellowknife in the Northwest Territories, at a capital cost of \$16 million. Start-up of production is planned for late 1981 at 180 tonnes/day and operating for 6 to 8 months per year. Drill

indicated and inferred reserves are 272 000 tonnes grading 25.3 grams gold per tonne. Approximately \$2 million has been spent to date on the deposit and some \$3 million in development expenditures is planned for 1980.

- iii) Noranda Mines Ltd. have announced that it will reopen and will bring to production the Camlaren gold mine, located at Gordon Lake 100 km northeast of Yellowknife, by 1981 at an estimated capital cost of \$4.5 million; the projected work force is in the order of 60 people. Reserves are 51 000 tonnes of 21.2 grams gold per tonne.
- iv) Echo Bay Mines is currently completing a \$6 000 000 underground exploration and development program at the Lupin gold property at Contwoyto Lake, some 400 km north of Yellowknife; a production decision will be made in early 1980.
- v) Canada Tungsten Mines have completed a mine/mill expansion program at the mine at Tungsten, that has doubled production to 900 tonnes per day.
- vi) Pine Point Mines has completed erection of a \$21 million drag line for overburden removal during open-pit mining of lead-zinc ore bodies in the Pine Point area. An extensive diamond drilling program was completed adjacent and distant from their producing lead-zinc deposits.
- vii) Western Mines continued a large program of development and exploration drilling on their X-25 and R-190 lead-zinc deposits in the Pine Point area. The R-190 was discovered in December 1978.
- viii) Amax completed underground development and bulk sampling of the Mactung tungsten property at MacMillan Pass.
- ix) Terra Mining and Exploration located on the east shore of Great Bear Lake continued exploration and development for silver mineralization on its Silver Bear Mine and on the Smallwood vein system at the Terra-Norex Joint Venture property.
- x) Cadillac Exploration Ltd. resumed exploration and development for a short period on the Prairie Creek silver-lead vein deposits; a 20 man crew worked on the property for a short time and shipping of high-grade silver ore via a winter road was considered. In March 1980 the company announced that the deposit would be brought to production in late 1981 at a capital cost of \$35 million.

Pine Point Mines Ltd.

Ore reserves remain at 34 million tonnes after mining and milling of 2.99 million tonnes in 1979, up 4.4% from 1978. Metal production in 1979 was 150 769 382 kilograms zinc and 53 959 603 kilograms lead; however, metal production declined by 27% for lead and 7% for zinc compared to 1978 because of lower grade ore. Production comes from nine open pits; the X-15 deposit was mined-out in 1979. A new dragline became fully operational in 1979 for stripping operation.

Type:	Open-pit
Location:	South shore of Great Slave Lake, 80 km east of Hay River
Product:	Lead, zinc
Rate:	8183 tonnes per day
Tonnes Milled:	2 985 568
Reserves:	34,473,600 tonnes
Reserve Grade:	1.9% lead, 5.0% zinc
Employees:	571

Nanisivik Mines Ltd.

Lead-zinc concentrates are shipped from Strathcona Sound on Northern Baffin Island to Europe during the short summer season. Nanisivik is the most northerly located mine in Canada. In 1979 milled tonnage increased to 615 461 tonnes up 7.2% to produce 76 311 000 kilograms of zinc and 7 647 000 kilograms lead, an increase of 4.5% for zinc and 6% for lead over 1978. A new decline adit was completed from surface to the east end of the mine workings; surface and underground drilling was also completed in this area.

Type:	Underground
Location:	29 km northeast of Arctic Bay
Product:	Zinc, lead, silver, cadmium
Rate:	1985 tonnes per day
Tonnes Milled:	615 461
Reserves:	4 766 000 tonnes
Reserve Grade:	11.3% zinc, 1.2% lead
Employees:	221

Giant Yellowknife Mines Ltd.

Ore production continued from underground and open pits of the Giant, Lolor and Supercrest mines. In 1979 the milled tonnage was 377 625 tonnes and production was 2 336 115 grams gold and 447 kilograms silver, a decrease of 21% in gold and 41% in silver compared to 1978. Open-pits contributed 29% of the mill feed.

Type:	Underground and open-pit
Location:	2.4 km north of Yellowknife
Product:	Gold-silver
Rate:	1032 tonnes per day
Tonnes Milled:	377 625
Reserves:	1 863 389 tonnes
Reserve Grade:	7.05 grams gold per tonne
Employees:	347

Cominco Ltd. (Con-Rycon Mines)

Cominco Ltd. constructed new offices and shops at a cost of \$1 million adjacent to the new Robertson shaft. A total of 196 471 tonnes of ore were milled in 1979 to produce 2 952 172 grams gold and 632.4 kilograms silver, a decrease of 17% in gold and 33% in silver compared to 1979.

Type:	Underground
Location:	2.4 km south of Yellowknife
Product:	Gold-silver
Rate:	592 tonnes per day
Tonnes Milled:	196 471
Reserves:	1 633 000 tonnes
Reserve Grade:	17.8 grams gold per tonne
Employees:	289

Echo Bay Mines Ltd.

Echo Bay Mines Ltd. maintained production from the Eldorado Mine. The No. 3 adit of the Echo Bay Mine was reopened to recover known ore and to carry out exploration. A total of 36 169 tonnes of ore was milled in 1979 to produce 61 309 kilograms of silver and 235 663 kilograms of copper. Silver production decreased by about 10% compared to 1978.

Type:	Underground
Location:	Port Radium
Product:	Silver, copper
Rate:	103 tonnes per day
Tonnes Milled:	36 169
Reserves:	Not available
Employees:	133

Terra Mining and Exploration Ltd.

Mining continued from the Silver Bear and Smallwood Lake mines. Unforeseen delays in bringing the Terra-Norex Resources Smallwood Lake mine to production resulted in an abnormally low production year. The company milled 31 021 tonnes of ore in 1979 to produce 11 201 kilograms silver and 294 958 kilograms copper; 1978 production was 44 608 kilograms silver. Certain zones in both mines contain significant amounts of bismuth, cobalt and nickel.

Type:	Underground
Location:	16 km south of Great Bear Lake
Product:	Silver, copper bismuth
Rate:	86 tonnes per day
Tonnes Milled:	31 021
Reserves:	Not available
Employees:	86

Canada Tungsten Mining Corporation

The company completed a mine/mill expansion program raising capacity to 900 tonnes per day. In 1979 the milled tonnage was at a record high of 249 633 tonnes to produce 3 275 000 kilograms of tungsten trioxide, an increase of 13.5% over 1978. Full production capacity was only attained toward the end of 1979.

Type:	Underground
Location:	Tungsten, N.W.T.
Product:	Tungsten
Rate:	900 tonnes per day
Tonnes Milled:	249 633
Reserves:	3 560 000 tonnes (estimate)
Reserve Grade:	1.55% tungsten trioxide (estimate)
Employees:	206

Mineral Exploration

Mineral claims staked and recorded in the Northwest Territories during the year, with comparative figures for 1978 are tabulated below:

Districts	1978		1979	
	Claims Re- corded	Area (Hec- tares)	Claims Re- corded	Area (Hec- tares)
Mackenzie	919	727 151	780	579 937.69
Arctic and				
Hudson Bay	796	693 683	528	454 961.79
Nahannie	37	19 011	42	17 093.01
Total	1 752	1 439 845	1 350	1 051 992.49

Exploration activity continued at a good pace in 1979 with exploration expenditures similar to that in 1978 of \$32 to \$35 million. As in 1978 exploration projects were heavily directed toward discovery and definition of uranium mineralization which absorbed some 75 percent of all exploration expenditures; however, with the recent rapid increases of metal prices, particularly precious metals, significant

exploration efforts were directed toward base/precious metals. A request for a permanent injunction by the Inuit of Baker Lake to exclude a 70 000 square kilometer region around Baker Lake for exploration and mining was denied by the courts in late 1979. Because of this decision it is anticipated that exploration activity will increase in this area in 1980.

A summary of exploration completed by the various exploration and mining firms is given in Table III. The location of these exploration activities are given a common number on Table III and illustrated on the map, Mineral Exploration and Mining, Northwest Territories, 1979.

Uranium

Uranium exploration continued largely in Proterozoic basins containing sediments and metasediments that are known to host several styles of uranium deposits including the unconformity vein-type. The main areas where exploration activity was incurred in decreasing intensity include:

- i) Baker Lake — Dubawnt Lake
- ii) Coppermine — Dismal Lakes — Hornby Bay
- iii) Nonacho Lakes
- iv) Bathurst Inlet Area

Lesser but significant exploration activity occurred in the East Arm Great Slave Lake and south of Great Bear Lake. Many sizeable exploration programs including extensive airborne geophysical surveys, ground reconnaissance and ground detailed surveys, and diamond drilling were undertaken.

The Baker-Dubawnt Lake areas (4 to 36) incurred the largest uranium exploration efforts. Major national and international mining organizations including Urangesellschaft, Pan Ocean Oil, Noranda Explorations, BP Minerals, Essex Minerals, Marline Oil, Western Mines and Cominco completed major exploration programs in the area. Sizeable diamond drilling programs were completed by Urangesellschaft at Sissons Lake (15) on their Lone Gull deposit

(4641 meters over 45 holes) and at Gravel Hill (34) (1534 meters over 10 holes). Pan Ocean Oil completed moderate to large diamond drilling programs at Yalthkyed Lake (22) (3631 meters over 46 holes) and at Nutarawit Lake (21) (2852 meters over 65 holes). Cominco completed 1998 meters of drilling over 23 holes at Nowleye Lake (31). Other drilling programs were undertaken by Essex Minerals and E & B Explorations. In addition another eight companies completed smaller exploration programs. Several significant uranium deposits including the Lone Gull (Urangesellschaft), Amer Lake (Aquitaine), and the 68-2 & 8 (Pan Ocean Oil) have been discovered in the Baker — Dubawnt Lake area over the last few years. Unquestionably the potential to discover and define additional uranium mineralization is considered high. Significantly some 14% of Canada's prognosticated* uranium resources are defined to be available from the Northwest Territories.**

*Prognosticated resources refer to estimated tonnages beyond specific limits established for inferred ore. They may include tonnages of portions of identified orebodies or of concealed satellite orebodies, the existence of which can be assumed along well established geological trends associated with known deposits. The attributes of prognosticated resources are, as a rule, derived by extrapolation from identified deposits or by quantification of geological information.

**1978 Assessment of Canada's Uranium Supply and Demand; Report EP-79-3, June 1979, Energy, Mines and Resources, p. 9.

In the Nonacho Lakes area (37 to 40) Kelvin Energy, Uranerz; Saskatchewan Mining Development Corp, PNC Exploration, and Seru Nuclear completed exploration programs. Kelvin Energy announced a uranium discovery at Louison Lake (37) where six diamond drill holes have confirmed uranium mineralization in an area 90 meters by 60 meters and to an approximate depth of 30 meters. Reported grades vary from 0.25 to 2.0 kg

U₃O₈ per tonne. Uranerz completed 3051 meters of drilling over 36 holes on a uranium showing at Powder Lake. South of Great Bear Lake (44 to 46) Chevron, A.G.I.P. Canada, and Major Resources completed smaller exploration programs. Major Resources drilled uranium showings at Beaverlodge Lake.

In the Coppermine — Dismal Lake — Hornby Bay area (47 to 52) extensive exploration programs including large drilling programs were undertaken by BP Minerals (4610 meters over 36 holes) on numerous properties (49); Cominco (2436 meters over 23 holes) on their Pec uranium deposit (50); and by Gulf Minerals (1956 meters over 15 holes) on Permit 452 and their John claims (51). On the Pec, uranium mineralization is disseminated through sandstones and conglomerates now thought to belong to the Dismal Lake Group. The target is separated stratigraphically from the much explored Aphebian — Helikian unconformity by some fifteen to eighteen hundred meters. Eldorado Nuclear completed extensive reconnaissance programs over much of the western Bear Province. Smaller exploration programs were undertaken by Uranerz, Hudson's Bay Oil and Gas and Esso Resources.

In the Bathurst Inlet area (53 to 55) Cominco completed exploration programs over the Paleohelikian Elu Basin and Hiukitak Platform and to the south in the Kilohigak Basin. Drilling programs were completed on:

- i) a pitchbende — bearing vein on the JCW claims and
- ii) on the Pomie claims where pitchbende — bearing fracture fillings occur in basalt flows contained within the sedimentary Brown Sound Formation.

Base Metals

The search for base metals including copper, zinc, lead, nickel, and tungsten was carried out in five distinct geographical/geological areas of the Northwest Territories which are:

- i) Arctic Islands including northern Baffin Island and Little Cornwallis Island.
- ii) Ennadi volcanic belt of southeastern Keewatin.
- iii) Pine Point area south of Great Slave Lake.
- iv) Slave structural province extending from East Arm of Great Slave Lake to Bathurst Inlet area.
- v) Mackenzie Mountains.

In the Arctic Islands, Nanisivik Mines continued underground and surface diamond drilling (8439 meters over 84 holes) toward the east end of the lead-zinc Strathcona deposit (57). Cominco through their subsidiary, Arvik Mines Ltd., in November 1979 announced that the Polaris lead-zinc deposit on Little Cornwallis Island (56) will be brought to production in 1982 at a rate of 2000 tonnes per day, and at a capital cost of \$150 million. During 1979 engineering and feasibility studies were completed. Mineralization is found as massive and disseminated galena and sphalerite within vugs and fractures of dolomitic limestone. Reserves are 22.7 million tonnes grading 14.1% zinc and 4.3% lead.

In the Ennadi volcanic belt Gulf Minerals (59) completed ground geophysical and diamond drilling surveys on their copper-zinc deposit near Ennadai Lake. St. Joseph Explorations completed ground geophysical surveys on their Heninga Lake copper-zinc deposits and Esso Minerals also completed geophysical surveys on their Ferguson Lake (58) nickel-copper deposit.

In the Pine Point area (60-61) Western Mines, Cominco, Gulf Minerals, and Pacific Petroleum completed exploration programs for stratabound Mississippi — Valley-type lead-zinc mineralization. Western Mines in December 1978 discovered a new deposit, the R-190, near the Little Buffalo River; potential reserves are 1.27 million tonnes of 18% combined lead-zinc. In 1979, 24 003 meters of diamond drilling over 124 diamond holes were completed on detailed drilling and to test for additional mineralization. Cominco Ltd.

and Gulf Minerals completed drilling programs west and southwest of Hay River; the Cominco drilling program involved 5893 meters over 16 holes. Pacific Petroleum also completed a drilling program on the Cube claims southwest of Pine Point and subsequently dropped their option. Pine Point Mines continued extensive development and exploration drilling programs over, adjacent and distant from their producing lead-zinc deposits in the Pine Point area; a total of 52 353 meters of drilling over 926 holes is reported.

In the Slave Province (62 to 68) Noranda completed exploration surveys and 2905 meters of diamond drilling over no less than seven separate properties in the Mara River, Hackett River, James River and Courageous — Mackay Lakes in the search for volcanogenic copper — zinc — (lead) mineralization. Texas Gulf and Getty Canada completed exploration and drilling programs on their Point Lake (64) and Aylmer Lake (63) properties, respectively in the search for base metal mineralization. A total of 1410 meters over 8 holes was completed by Getty Canada at Aylmer Lake.

In the Mackenzie Mountains (69 to 81) mineral exploration was primarily directed toward discovery and evaluation of stratabound shale-hosted lead-zinc and skarn-type tungsten — copper mineralization. Significant exploration programs including diamond drilling were completed on the Gayna River (69), Vulcan (74) and Howard's Pass (75) lead-zinc properties of Rio Canex and Placer Development, respectively. Cadillac Explorations completed a limited amount of development work on the Prairie Creek (81) lead-zinc-silver vein deposits. Moderate to large size drilling programs and other surveys were completed on the Lened (76) (6069 meters over 57 holes) and Baker (77) (2412 meters over 29 holes) tungsten-copper properties of Union Carbide and Canada Tungsten, respectively. Amax completed underground diamond drilling (1773 meters over 15 holes) and removed a 272 tonne bulk sample of tungsten — copper mineralization from the Mactung property (71).

Precious Metals

Several production announcements were made in 1979, largely on gold deposits where reserves and tenor were defined some years ago; however with the rapid escalation in the price of gold over the last eighteen months these deposits have become economically viable. Mine developments concerning these deposits are summarized under Mining Development and Production. Precious metals exploration and development occurred in four distinct areas of the Northwest Territories which includes:

- i) Ennadi volcanic belt of southeastern Keewatin
- ii) Northern Slave Province: Contwoyto Lake — Bathurst Inlet Area
- iii) Great Bear Lake
- iv) Yellowknife Area

Within the Ennadi volcanic belt (82) O'Brien Resources in a joint venture with Consolidated Durham Mines and Resources have announced a production decision for their Cullaton Lake gold deposit. Gold mineralization occurs in sulphides found within magnetite-siderite-chert iron formation. Drill indicated and inferred reserves are 272,000 tonnes grading 25.3 grams gold per tonne.

In the Contwoyto Lake — Bathurst Inlet (83 to 86) U.S. Borax, Highwood Resources, Grant Yellowknife Mines, and Coronation Gold Mines completed exploration and diamond drilling programs on their respective properties. At Contwoyto Lake (86), Echo Bay Mines is currently completing a \$6 million underground exploration and development program on their Lupin gold deposit. At the end of 1979 some 1000 meters of underground drifting and extensive sampling had been completed. Gold mineralization is found in an arsenopyrite/pyrrhotite — bearing garnet — grunerite gneiss band. Feasibility and metallurgical studies are in progress; a production decision is anticipated in the late spring of 1980.

On the east side of Great Bear Lake (87) Echo Bay Mines initiated underground development and drilling (1067 meters over 20 holes) of their Contact Lake silver property. Giant Yellowknife Mines completed geological and geophysical surveys of their Omini claims.

In the Yellowknife area (88) Giant Yellowknife Mines Ltd. and Cominco completed exploration and development drilling at their producing gold mines totalling 11 665 meters over 123 holes and 1474 meters over 5 holes, respectively. Noranda Exploration Company drilled 86 meters on their Low claims at Walsh Lake.

Prospecting for placer gold was undertaken on the Little Keele River and the Liard River (89, 90).

Lithium, Diamond, Tourmaline

Viscount Resources evaluated lithium deposits 32 km east of Yellowknife (91) and Canadian Superior Explorations trenched lithium – bearing pegmatites north east of Yellowknife (92); Triflex sampled the Beryle I claim in the same vicinity for gem quality tourmaline. Diapros Ltd. sampled stream sediments in the Interior Plain from Norman Wells to Fort Simpson in the search for diamond-bearing kimberlitic diatremes.

In the Yukon and Northwest Territories the USA standard method of Recording and Measuring Work Injury Experience is used for the mining industry. The following criteria and definitions are used:

- i) In accidents resulting in death, permanent total disability or permanent partial disability, the number of days recorded as lost-time conforms with the time changes set down in the American Standard.
- ii) Disabling injuries are defined by the USA Standard as being those which result in death, permanent total disability, permanent partial disability or temporary total disability.
- iii) Days recorded as lost-time do not include the day of the accident or the day of return to work.
- iv) Accident frequency is expressed as the number of accidents per one million man-hours worked.
- v) Accidents severity is expressed as the number of days lost due to accidents per million man-hours.

Table IV illustrates Mining Accident Statistics for 1979 and 1978 for each respective mine in Yukon and Northwest Territories. During 1978 in Yukon there were no fatal mine accidents. There were, however, 83 disabling injuries that caused the loss of 1597 man days. The accident frequency was 39.4 as compared to 41.2 in 1978; the accident severity increased from 622 in 1978 to 758 in 1979. The main causes of disabling injury were "fall of persons" (20), "strain while lifting" (16), "foreign matter in eyes" (8), and "struck by moving objects" (6) and accounted for 60 percent of all injuries.

During 1979 in the Northwest Territories there were two fatal mine accidents; one at the Canada Tungsten Mine in April caused by falling rock and one in September at Pine Point Mines caused by falling hardpan. There were also 177 disabling injuries that caused the loss of 19,890 days. The accident frequency was 45.6, up from 40.2 in 1978; the accident severity increased from 953 in 1978 to 5,119 in 1979. The main causes of disabling injuries were "fall of persons" (31), "strain while lifting" (33), "caught between two objects" (22), and "struck by moving objects" (21), and accounted for 60 percent of all injuries.

MINERAL PRODUCTION CHART — 1970 — 1979 TABLE I
PRODUCTION DES MINÉRAUX — 1970 — 1979 TABLEAU I

NORTHWEST TERRITORIES — TERRITOIRES DU NORD-OUEST

MINERAL MINÉRAUX	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979(a)
Gold — Or g — (gr)	12 168 776 10 352 606	10 897 934 9 590 415	17 713 250 9 563 666	24 262 894 7 747 098	28 651 414 5 737 565	28 754 047 5 460 651	24 390 081 6 162 252	31 336 428 6 204 583	45 769 718 6 458 948	58 471 000 5 238 000
Silver — Argent g — (gr)	5 114 587 85 989 978	4 474 616 91 209 266	6 778 965 126 257 130	13 961 789 168 591 544	17 669 851 118 728 409	8 883 385 61 319 168	14 343 774 103 794 822	18 716 934 118 325 557	23 854 173 120 237 000	30 591 000 80 000 000
Copper — Cuivre kg — (kg)	766 578 598 970	727 595 626 060	577 416 514 268	1 106 319 786 610	840 719 491 923	526 889 374 885	639 980 424 469	445 850 291 959	518 993 315 624	633 000 269 000
Nickel — Nickel kg — (kg)										
Lead — Plomb kg — (kg)	37 842 405	22 629 795	27 838 277	32 261 787	34 932 761	37 254 292	26 440 157	40 833 313	56 898 673	72 437 000
Zinc — Zinc kg — (kg)	108 502 061	76 034 832	81 846 189	90 667 291	76 524 844	83 390 558	52 942 453	58 832 599	70 088 814	55 191 000
	76 004 563	75 056 384	64 792 006	87 541 226	132 251 480	106 650 304	122 438 035	125 104 245	143 911 352	206 985 000
	216 416 132	203 496 733	154 103 925	164 449 732	171 886 138	129 002 037	147 610 457	159 709 355	187 809 913	214 667 000
Uranium — Uranium kg — (kg)										
										250
Cadmium — Cadmium kg — (kg)	737 632 93 984	301 476 70 488	205 436 36 832	61 152 7 620		1 027 137	3 179 549	2 677 386		
Bismuth — Bismuth kg — (kg)	3 072 222	41 149 3 437								
Tungsten — Tungstène kg — (kg)										
		1 491 593	1 439 757	1 464 468	1 613 700	1 477 731	2 158 154	2 284 409	2 885 619	3 275 000
TOTAL	132 637 613	114 228 949	177 905 350	158 925 167	214 346 225	182 069 944	188 254 206	216 439 447	270 952 909	369 117 000

YUKON TERRITORY

YUKON										
Gold — Or g — (gr)	653 034 555 570	511 534 450 161	234 983 126 871	2 032 502 648 974	4 111 631 823 371	5 255 077 997 986	4 401 075 1 111 949	4 656 118 921 907	8 518 731 1 202 149	8 675 000 778 000
Silver — Argent g — (gr)	7 845 312	8 966 417	8 331 575	15 342 856	26 800 905	28 531 397	12 809 321	20 154 760	28 462 559	50 315 000
	131 900 794	178 773 547	155 174 219	188 921 678	180 082 381	196 943 109	92 697 630	127 415 268	143 459 000	132 000 000
Lead — Plomb kg — (kg)	20 830 196	29 340 379	34 392 366	38 013 324	41 194 600	54 888 680	15 999 040	47 627 667	64 322 403	107 928 000
	59 724 512	98 582 016	101 115 601	106 831 187	90 242 227	122 863 633	32 035 681	68 621 899	79 233 298	82 232 000
Copper — Cuivre kg — (kg)	9 148 995	2 709 696	890 286	14 791 665	15 571 426	11 928 559	16 045 963	8 953 814	16 474 354	18 053 000
	7 148 616	2 327 836	792 922	10 517 104	9 111 183	8 487 245	10 642 540	5 843 210	10 018 826	7 669 000
Coal — Charbon tonnes —										
	9 896	19 074	16 724	17 782	15 447	23 326	9 046	18 779	16 578	23 003
Zinc — Zinc kg — (kg)	24 845 216	39 003 342	45 341 287	61 167 027	60 899 995	95 400 540	39 233 926	80 562 287	74 076 827	114 593 000
	70 744 510	105 747 869	107 603 704	114 904 734	79 151 212	115 394 553	47 300 153	102 846 637	96 673 141	118 843 000
Cadmium — Cadmium kg — (kg)	261 528	114 654	82 759	45 718	17 331	15 423	13 220	11 595	355	
	33 322	26 807	14 837	5 697	1 977	2 050	2 284	1 670	58	
Asbestos — Amiante tonnes —	13 927 652	12 374 380	13 006 476	13 915 140	22 752 400	32 820 720	35 310 723	47 493 872	26 948 800	
	95 833	84 433	92 431	91 384	82 459	103 735	103 431	95 590	53 255	
Nickel — Nickel kg — (kg)			3 996 762	5 209 621						
			1 276 691	1 544 473						
Platinum — Platine g — (gr)			325 573	149 458						
			112 750	40 870						
TOTAL	77 511 933	93 020 402	106 502 067	150 667 311	171 348 288	228 840 396	123 813 268	209 460 113	218 804 029	299 564 000

(a) Preliminary Figures
Valeurs préliminaires

Exploration and Mine Development Stages as Depicted in Tables II & III

	STAGE	ACTIVITY (in part or total)	PURPOSE
1	Reconnaissance Exploration	Stream sediment and water sampling; reconnaissance geological mapping and prospecting; airborne geophysical surveys: radiometric, electromagnetic and magnetic; Staking.	To locate anomalies. An anomaly is an area of the earth having properties which deviate from normal. A lake having unusual amounts of uranium in the bottom sediments, or rocks with high electrical conductivity are examples of anomalies.
2	Detailed Ground Follow-up	Detailed soil geochemical surveys; radiometric, magnetic, electromagnetic, gravimetric and other geophysical surveys; prospecting for mineralized outcrops; detailed geological mapping.	To confirm the presence of the reconnaissance anomalies before drilling or trenching.
3	Exploratory Drilling and Trenching	Sampling of shallow anomalies by blasting trenches to expose fresh rock; sampling of overburden by shallow drilling; diamond drilling of bedrock to depths of up to several thousand feet; chemical analysis of core samples.	To determine if the mineralized body is of sufficient size and quality to justify the high costs of future development work.
4	Systematic Predevelopment Work and Preliminary Economic Evaluation	Closely spaced diamond drilling; ore-reserve calculations; preliminary mining and metallurgical studies; start environmental studies; preliminary economic evaluation including market studies.	To establish ore reserves, production rate, profitability.
5	Final Feasibility Study	Engineering design of mine, mill and ancillary services; environmental impact assessment; final economic evaluation — financing.	To determine if mine should be brought into production.
6	Mine Development	Establish operating organization; development of underground or open-pit mine; construction of treatment plant and ancillary services including transportation and community requirements.	To prepare the mine for production. This stage normally involves contractors and consultants each having expertise in specific areas.
7	Mining & Milling Operation	Mining and milling of the ore and marketing of the product.	Following a tune-up period the new mine normally reaches its rated capacity within the first year. In a joint-venture project each partner is responsible for marketing its share of the product from the operation.

**TABLE II
EXPLORATION — YUKON**

LOCATION ⁽¹⁾	COMPANY ⁽²⁾	PROPERTY/AREA ⁽³⁾	MINERAL- ⁽⁴⁾ IZATION	EXPLORATION STAGES ⁽⁵⁾						
				1	2	3	4	5	6	7
1	St. Joseph Explorations	TING	Pb-Zn(Mo)							
1	Getty Canadian Metals	KAREN	—							
2	St. Joseph Explorations	MEL	Pb-Zn-Ba			xx				
3	St. Joseph Explorations	ROMAN	Pb-Zn-Ba							
4	Klondike Silver Mines	FREER CREEK	Ag-Pb-Zn							
5	Cima Resources	MT. HUNDERE	Pb-Zn-Ag							
6	Asarco Exploration	LAN	—							
7	Sovereign Metals	MATT BERRY	Pb-Zn-Ag							
8	Utah Mines	MAXI	Pb-Zn-Ag			x				
9	Getty Canadian Metals	MARY-LOU	Pb-Zn-Cu			xx				
10	Placer Development	Howards Pass	Pb-Zn							
11	Cominco	RITZ	Pb-Zn							
12	Hudson Bay Exploration	TOM	Pb-Zn-Ag				x			
12	Pan Ocean Oil	JASON	Pb-Zn			x				
13	Cominco	NIDD	Pb-Zn-Ag							
14	AGIP Canada	NEVE	Pb-Zn							
15	AGIP Canada	GOAT, ICE	—							
16	St. Joseph Explorations	HENCH	Pb-Zn-Cu							
17	Newmont Exploration	CYR	Pb-Zn-Ag							
18	Iona Silver Mines	Ketza River	Ag-Pb-Zn							
19	Noranda	LETA	—							
19	Noranda	TAKU	Pb-Zn-Cu							
19	AGIP Canada	PIKA	—							
19	M. Serman	MAT	Pb-Ag							
19	Noranda	PEAK/CANOL	Ag-Pb-Zn							
20	Amax Potash	GREW	Pb-Zn							
21	Welcome North	SUNSET	Pb-Zn							
21	Welcome North	ANGIE	Zn-Ag							
22	Welcome North	RACHEL	Pb-Zn							
22	Welcome North	RUTH	Pb-Zn							
23	Welcome North	DEV	Pb-Zn							
23	Cyprus Anvil Mining	Anvil Mine/Faro Area	Zn-Pb-Ag			xx				
24	Welcome North	DOT	—							
24	Amax Potash	Fishhook Creek	Pb-Zn			x				
25	Conwest Exploration	Clear Lake	Pb-Zn							
26	Canadian Superior	SIAN	Zn-Pb-Ag							
26	Northair Mines	LEAH	Pb-Zn-Hg							
27	McIntyre Mines/ Canadian Superior	CRAIG	Zn-Pb-Ag							
27	Prism Resources	VAL	Pb-Zn-Ag			xx				
27	Prism Resources	VERA	Pb-Zn-Ag			x				
27	Canadian Superior	PAT	—							
27	Canadian Superior	ROD	Pb-Zn-Ag							
27	Prism Resources	ZAP	Pb-Zn-Ag							
28	Prism Resources	DEP	Pb-Zn-Ag							
29	Mattagami Lake Expl.	DALE	Pb-Cu							
30	United Keno Hill	Galena/Keno Hills	Ag-Pb-Zn							
31	Cominco	HOLLY	Pb-Zn							
31	Cominco	CLIP	—							
31	Cominco	PLUTO	—							
32	Cominco	MICKEY	—							
32	Noranda	RAIL	—							
33	Rio Alto Exploration	Rusty Springs	Pb-Zn							

LOCATION ⁽¹⁾	COMPANY ⁽²⁾	PROPERTY / AREA ⁽³⁾	MINERAL- ⁽⁴⁾ IZATION	EXPLORATION STAGES ⁽⁵⁾						
				1	2	3	4	5	6	7
34	Amax Northwest Mining	Mac Tung	W-Cu				x			
35	Placer Development	CLEA	W							
36	Riocanex	VIKING	—							
37	Riocanex	WOAH	W							
38	Noranda	ROSE	W							
39	Tungco Resources	Turner Tungsten	W							
40	Eldorado Nuclear	ELLE	—							
40	Eldorado Nuclear	CAB	—							
40	Du Pont of Canada	J	—							
40	Serem	CABIN	—							
41	Amax Potash	Tootsee River	W							
42	Du Pont of Canada	PINE	Sn							
42	D.C. Syndicate	MUN	W-Zn-Sn							
42	Du Pont of Canada	H	W							
42	Du Pont of Canada	VAL	Sn							
42	Du Pont of Canada	Smart River	Sn, W							
43	Du Pont of Canada	SKIN	—							
43	Amax Potash	LOGTUNG	W, Mo							
43	D.C. Syndicate	M.W.	—							
43	Du Pont of Canada	SWIFT	Sn							
43	Du Pont of Canada	GW	Sn							
43	D.C. Syndicate	CAN	—							
43	D.C. Syndicate	JC	W, Sn							
44	Du Pont of Canada	DU	Sn, W							
44	Du Pont of Canada	I	—							
44	Newmont Exploration	MORK	Mo							
44	Eldorado Nuclear	TAT	—							
45	Du Pont of Canada	DB	W							
45	Eldorado Nuclear	MICH	—							
45	Urangesellschaft	ABBA	—							
45	Newmont Exploration	MINDY	—							
46	AGIP Canada	CASTOR	Mo, U				x x			
47	Amoco Canada	Red Mountain	Mo							
48	Amax Potash	Dycer Creek	—							
49	AGIP Canada	Cold Mountain	—							
49	Rio Alto Exploration	Stormy Mountain	Mo, W							
50	Archer, Cathro	BOOT	W				x			
51	Hudson Bay Exploration	Risby Tungsten	W				x			
51	Welcome North	PIM	W, Cu							
52	Prism Resources	BLUELITE	W							
53	Amax Potash	Lynx Creek	W							
53	Canada Tungsten	Tin Dome	Sn							
53	Canada Tungsten	Potato Hills	W							
53	Canada Tungsten	Dublin Gulch	placer W, Au, Sn							
54	Canada Tungsten	McQuesten River	—							
54	CCH Resources	Mayo Area	Sn							
55	Cominco	Sunshine Creek	Sn							
55	Cominco	Scheelite Dome	W							
55	Amax Potash	Red Mountain	—							
56	Mattagmi	MARN	W, Cu							
57	United Keno Hill	Venus Mine	Au, Ag, Pb							
58	Whitehorse Copper	Whitehorse Copper Belt	Cu, Au, Ag				x			
59	Halferdahl & Associates	BUR	Pr, Ni, Cu							
60	Noranda	DART	—							
61	United Keno Hill	McQuesten River	Au, placer							

LOCATION ⁽¹⁾	COMPANY ⁽²⁾	PROPERTY/AREA ⁽³⁾	MINERAL- ⁽⁴⁾ IZATION	EXPLORATION STAGES ⁽⁵⁾						
				1	2	3	4	5	6	7
62	Getty Mines	NOR	U, Cu							
63	Pan Ocean Oil	Fairchild Lake	U, Co, Cu							
64	Pan Ocean Oil	Kiwi Lake	U			x				
64	Wernecke Joint Venture	IGOR	U, Cu							
65	Rio Tinto	IDA	—							
66	Anaconda Canada	Antimony Mountain	—							
67	Archer, Cathro	TING	U			x				
67	Urangesellschaft Canada	TETA	U							
67	Mattagami Lake Explor.	TRIX	U, Sb, Cu							
67	Anaconda Canada	German Creek	—							
68	Union Miniere	ROB	U, Cu							
69	Eldorado Nuclear	JOVE	U							
70	Eldorado Nuclear	HASL, NEF	U							
71	Sovereign Metals	JAN	Barite							
72	NL Baroid	CATHY	Barite							
73	Union Miniere	REIN	Barite							
74	Placer Development	Watson Lake	Coal							
75	Pan Ocean Oil	Bonnet Plume Basin	Coal			x x				

FOOTNOTES for Tables II & III

- (1) Table location is made with reference to corresponding numbers on Yukon and Northwest Territories Maps. Locations are approximate.
- (2) Abbreviated name of the Company is used: Expl. (Exploration), Ltd. (Limited)
- (3) Geographical areas are indicated by small print, whereas claims and groups are capitalized. Abbreviated words are: Peninsula (Pen).
- (4) Metal(s) of primary importance defined by chemical symbols: copper (Cu), gold (Au), lead (Pb), molybdenum (Mo), silver (Ag), barium (Ba), cobalt (Co), tin (Sn), tungsten (W), and uranium (U); other abbreviations include: placer (pl.), production(pr.)
- (5) Note drilling under Stage 3 in excess of 1400 meters (4600 feet) is denoted by an "x" and that in excess of 3000 meters (9840 feet) by "x x".

TABLE III
EXPLORATION — NORTHWEST TERRITORIES

LOCATION ⁽¹⁾	COMPANY ⁽²⁾	PROPERTY/AREA ⁽³⁾	MINERAL- ⁽⁴⁾ IZATION	EXPLORATION STAGES ⁽⁵⁾						
				1	2	3	4	5	6	7
1	Dejour Mines	Fury & Hecla St.	U							
2	Noranda	Melville Pen	U							
2	Cominco	Melville Pen	U							
3	Aquitaine	Cape Dorset	U							
4	Urangesellschaft	Tehek Lake	U							
5	Urangesellschaft	Tehek Lake	U							
6	Urangesellschaft	Tehek Lake	U							
6	Essex Minerals	Tehek Lake	U							
7	Urangesellschaft		U							
7	Essex Minerals		U							
8	Urangesellschaft	Sand Lake	U							
9	Urangesellschaft	Whitehills Lake	U							
10	Texasgulf	Garry Lakes	U							
11	Texasgulf	Aberdeen Lake	U							
12	Texasgulf	Aberdeen Lake	U							
13	Western Mines	Aberdeen Lake	U							
14	Essex Minerals	Schultz Lake	U							
15	Urangesellschaft	Seasons Lake	U							
16	Urangesellschaft	Majorie Lake	U							
17	Urangesellschaft	Mallery Lake	U							
18	Comminco	Aberdeen Lake	U							
18	Marline Oil	Aberdeen Lake	U							
19	Cominco	Baker Lake	U							
19	Seru Nucleaire	Pitz Lake	U							
20	Pan Ocean Oil	Martell Lake	U							
21	Pan Ocean Oil	Nutarawit Lake	U							
22	Pan Ocean Oil	Yathkyed Lake	U							
22	Urangesellschaft	Yathkyed Lake	U							
22	Essex Minerals	Yathkyed Lake	U							
22	Noranda	Yathkyed Lake	U							
23	Noranda	Baker Lake	U							
19	Noranda	Baker Lake	U							
24	Comaplex Resources	Forde Lake	U							
25	Marline Oil	Tebesjuak Lake	U							
26	Dual Resources	Ameto Lake	U							
27	PNC Explorations	South Henik Lake	U							
28	PNC Explorations	Trebel Lake	U							
29	E & B Explorations	Downer Lake	U							
30	W.G. Wahl	Nueltn Lake	U							
31	Cominco	Nowleye Lake	U							
31	Noranda	Nowleye Lake	U							
32	Noranda	Kamilukuak Lake	U							
33	Esso Minerals	Beaverhill Lake	U							
34	Urangesellschaft	Gravel Hill	U							
35	Placer Development	Enekatcha Lake	U							
36	Hudsons's Bay Oil & Gas	Beaverhill Lake	U							
36	Urangesellschaft	Beaverhill Lake	U							
36	Esso Minerals	Beaverhill Lake	U							
36	Gulf Minerals	Beaverhill Lake	U							
37	Kelvin Energy	Louison Lake	U							
38	Uranerz Exploration	Powder Lake	U							
39	SKMD	Thekultili Lake	U							
39	PNC Exploration	Thekultili Lake	U							

LOCATION ⁽¹⁾	COMPANY ⁽²⁾	PROPERTY/AREA ⁽³⁾	MINERAL- ⁽⁴⁾ IZATION	EXPLORATION STAGES ⁽⁵⁾						
				1	2	3	4	5	6	7
40	Seru Nucleaire	Thekulthili Lake	U							
41	Chevron Standard	Union Island	U							
42	Highwood Resources	Thor Lake	U							
42	AUU Syndicate	Thor Lake	U							
43	Giant Yellowknife	Edzo Road	U							
44	Major Resources	Beaverlodge Lake	U							
45	Chevron Standard	Wop-Levi								
46	AGIP Canada	Permits 387-392	U							
47	Hudson's Bay Oil & Gas	FAT, BDIEGM	U							
47	B.P. Minerals	Kamut Lake	U							
48	B.P. Minerals	Coppermine River	U							
49	B.P. Minerals	Coppermine River	U			xx				
50	B.P. Minerals	Kendall Lake	U							
50	Cominco	PEC (Dismal Lakes)	U			x				
50	Esso Resources	Dismal Lakes	U							
51	Gulf Minerals	Permit 452, JOHN	U			x				
52	Uranerz Explorations	September Mountains	U							
53	Cominco		U							
54	Cominco	JCW	U							
55	Cominco	POMIE	U							
56	Cominco	Polaris Deposit	Pb-Zn			xx				
57	Nanisivik	Strathcona Sound	Pb-Zn			xx				
58	St. Joseph Expl.	Heninga Lake	Cu-Zn							
58	Esso Minerals	Ferguson Lake	Ni							
59	Gulf Minerals	Ennadi Lake	Cu-Zn			xx				
60	Pine Point Mines	Pine Point	Pb-Zn			xx				
60	Western Mines	X-25, R190	Pb-Zn			xx				
60	Pacific Petroleum	CUBE, Poplar Lake	Pb-Zn							
61	Gulf Minerals	Hay River	Pb-Zn			xx				
61	Cominco	Hay River	Pb-Zn			xx				
62	U.S. Borax	Bigstone Point	Cu-Zn							
63	Getty Canada Metals	Aylmer Lake	Cu-Zn			x				
64	Texasgulf	HEK, Point Lake	Cu-Zn							
65	Noranda	DEB	Cu-Zn							
66	Noranda	Mara River	Cu-Zm							
67	Noranda	Hackett River	Cu-Zn							
68	Noranda	James River	Cu-Zn							
69	Rio Canex	Gayna River	Pb-Zn							
70	Canico		Pb-Zn							
71	Amex	Mac Tung	W-Cu							
72	Shell Canada	Hutch Mountain	Cu							
73	Welcome North	Divide Lake	Pb-Zn							
74	Rio Canex	VULCAN	Pb-Zn							
75	Hudson Bay Oil & Gas	Howards Pass	Pb-Zn							
75	Canex Placer	Howards Pass	Pb-Zn			xx				
76	Union Carbide	LENED	W-Cu							
77	Canada Tungsten	BAKER	W-Cu			x				
77	Cominco	LICA								
78	Getty Mines	Howards Pass	Pb-Zn							
79	Hudson Bay Oil & Gas		Pb-Zn							
80	Archer, Cathro	Coal River	Cu-Pb							
81	Cadillac Exploration	Prairie Creek	Pb-Zn-Ag							
82	O'Brien Energy	Cullaton Lake	Au							
82	Cominco	Kognak River	Au							
83	U.S. Borax	FF	Au							
83	Highwood Resources	Regan Lake	Au							

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				1	2	3	4	5	6	7
84	Giant Yellowknife	TMK	Au							
85	Coronation Gold	Arcadia	Au							
86	Echo Bay Mines	Contwoyto Lake	Au							
87	Echo Bay Mines	Contact Lake	Ag							
87	Giant Yellowknife	Balachey Lake	Ag-Au							
88	Giant Yellowknife	Giant Mine	Au			x x				
88	Cominco	Con Mine	Au			x				
88	Noranda	LAW	Au							
89	—	Keele River	Au pl.							
90	E. Linberg	Nahanni Butte	Au pl.							
91	Viscount Resources	Yellowknife	Lithium							
92	Canadian Superior	BIG, FI	Lithium							
92	Triflex Ltd.	BERYL I	Tourmaline							
93	Diapros	Interior Plains	Diamond							
		Norman Wells								
		Ft. Simpson								



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Mines and Minerals Activities 1980

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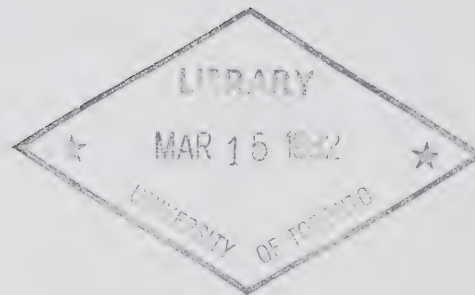
Northern Affairs Program



Mines and Minerals Activities 1980

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Summary

For the second year in a row a high mood of optimism was evident in mining operations and mineral exploration in the North. Record high base and precious metal prices boosted 1980 revenues to record highs in the Yukon and the Northwest Territories. Mineral exploration and mine development has historically been primarily directed toward discovery of high unit-value metal mineralization; however, with increased metal prices many previous marginally and subeconomic deposits have become economically viable and several mine development/production announcements have been made.

Mineral production in the Yukon Territory during 1980 was valued at \$343 million excluding coal, tungsten and natural gas, an increase of 15 per cent from 1979. Production came from four mines; Cyprus Anvil, United Keno Hill, Whitehorse Copper and Tantalus Butte which produced zinc, lead, silver, copper, gold, cadmium and coal. Gold production was valued at about \$63 million of which about 76 per cent came from placer mining operations. The Yukon accounted for 24.4 per cent of the lead and 10.2 per cent of the zinc, 12.1 per cent of the silver, 6.2 per cent of the gold and 1.1 per cent of the copper production in Canada.

In 1980, the Yukon accounted for 1.06 per cent of the value of total Canadian mineral production and for 3.6 per cent of Canadian metal production.

Placer gold mining was strongly stimulated by the high gold prices which prevailed during 1980 and production doubled from the previous year. During the year export royalties were paid on 2 271 363 grams of gold from 150 placer operations. Placer gold production increased 208 per cent over the 1979 rate of 1 090 906 grams.

Development work continues on a number of properties. Cyprus Anvil Mining Corporation⁽⁶⁾ announced an important expansion program which includes development of two new open pit mines on the Grum and Vangorda ore bodies. By 1985 the Vangorda pit will be mined concurrently with ore from the Faro mine and by 1988 the Grum pit will begin production. The development will extend mining in the Anvil area from 1989 to 1997. The \$240 million program will be spread over eight years, 1980-88. Substantial modifications to the Anvil mill, expansion of the tailings containment area and construction of a new power plant are required. Mill modifications are scheduled for completion by the end of 1981 at an estimated cost of \$71.5 million.

United Keno Hill Mines Ltd. is developing its Venus Mine⁽⁵⁷⁾, a gold-silver-lead vein deposit for production. The mine is located 88 km south of Whitehorse near the Yukon-British Columbia border. The mine and new 91 t per day mill under construction are scheduled for production in late summer 1981. Reserves are 108 600 t grading 6.84 g gold per t and 205 g silver per t with values of lead, zinc and cadmium.

A \$300 000 bullion refinery is being constructed at Elsa by United Keno Hill Mines to treat cyanide precipitates from Keno Hill and Venus operations. The refinery will produce 950 fine silver.

Hudson Bay Mining and Smelting has started a three-year, \$10 million underground exploration and development program on its TOM property⁽¹¹⁾, a stratiform lead-zinc-silver-barite deposit at MacMillan Pass. The company did 1 400 m of fill-in drilling in 1980. The program entails underground development and exploration including a decline to be driven in 1981. The program is preparatory to a final feasibility study.

Also in the MacMillan Pass area straddling the Yukon-Northwest Territories border is the huge MacTung⁽¹¹⁾ tungsten deposit of Amax of Canada Limited. A final feasibility study based on 907 t per day underground operation is expected to be completed in the spring of 1981 and the company expects to make a production decision soon thereafter.

Logtung Resources Limited and Amax Minerals Exploration have reported that 11 holes totalling 2 850 m were drilled on the Logjam scheelite - molybdenite property⁽⁶⁵⁾. A 500 m decline was completed and underground bulk sampling is being carried out. Reserves are estimated at 162 million t of 0.13 per cent tungsten trioxide and 0.052 per cent molybdenum disulphide.

At Howards Pass, Placer Development Ltd.⁽³⁾ continued exploration on its shale-hosted lead-zinc deposits. In 1980 an adit was driven into the main mineralized zone to check the continuity of mineralization and to obtain bulk samples for metallurgical testing.

At Dublin Gulch, Canada Tungsten Mining Corporation⁽⁵³⁾ commenced operations in June with its 1 520 m³ per day placer plant designed to recover fine gold and scheelite.

Metal mining production in the Northwest Territories during 1980 was valued at \$446 million, including tungsten which was valued at approximately \$68 million. Metal production came from eight mining establishments which produce zinc, lead, tungsten, gold, silver, copper and cadmium.

The Northwest Territories accounted for almost 100 per cent of the tungsten, 20.1 per cent of the lead, 22.0 per cent of the zinc, 9.0 per cent of the

gold, and 4.4 per cent of the silver production and 4.6 per cent of Canadian metal production.

Projections to late 1981 early 1982 indicate that at least four additional underground mines will be producing in the Northwest Territories. These are Cadillac Explorations Limited's Prairie Creek Mine, the Cullaton Lake Gold Mine, Echo Bay's Lupin Mine, and Cominco Limited's Polaris Mine.

In the Nahanni region, Cadillac Explorations Ltd.⁽⁹⁰⁾ is developing a \$35 million underground mine at its Prairie Creek lead-zinc-silver deposit for initial production by late 1981. During 1980, a winter road was built from the mine to the Mackenzie Highway southeast of Fort Simpson and mine development work was carried out. Cadillac has sold a 40 per cent working interest in the Prairie Creek project to Procan Explorations Company for \$55 million.

Cullaton Lake Gold Mines, a joint venture of Consolidated Durham Mines and Resources Limited and O'Brien Energy and Resources Limited is developing its mine⁽⁷⁹⁾ in the Cullaton Lake area, Keewatin District with a program of 2 600 m of underground advance and 6 100 m of underground drilling. The company has announced a financing agreement with Inuit Development Corporation that will provide \$25 million to bring the property into production in the summer of 1981. Drill indicated reserves are 285 000 t grading 25.37 g gold per tonne.

IU International Corporation through its wholly-owned subsidiary Echo Bay Mines Limited, will bring its Lupin⁽⁸³⁾ gold property at Contwoyto Lake, 300 km east of Port Radium, into production in late 1982. Some \$10 million of the \$100 million development program has already been spent on exploration and preliminary development work. The deposit has been probed by a

1 060 m decline ramp and the company has expanded its airstrip to handle Hercules aircraft. Initial milling capacity will be 900 t per day. Known reserves of 2.45 million t grading 13 g gold per t give the mine a life expectancy of seven years. Prospects for additional ore are good.

Cominco has started development of its \$150 million Polaris⁽⁵⁰⁾ lead-zinc mine on Little Cornwallis Island in

the Arctic Islands. Polaris will be the most northerly mine in the world. The mine's annual production, an estimated 170 000 t of zinc concentrate and 38 000 t of lead concentrate will be shipped in ice-breaking and ice-strengthened vessels during the summer navigation season in arctic waters. Initial production is expected early in 1982, and the 2 000 t a day mill will be floated on a barge from Lauzon, Quebec to the mine area in 1981. Ore reserves are estimated at 23 million t averaging 14.1 per cent zinc and 4.3 per cent lead.

Introduction

This report covers mines and minerals activities North of 60° for the year 1980. All aspects of these operations in the Yukon and the Northwest Territories are administered by Northern Non-renewable Resources Directorate, Department of Indian Affairs and Northern Development.

Sections on mineral exploration in the Yukon were based on papers by D. Tempelman-Kluit, J.G. Abbott, R.L. Debicki and J.A. Morin and in the Northwest Territories by W.A. Padgham, W.A. Gibbins, P.J. Laporte, C.C. Lord, and J.B. Seaton.

As of June 8, 1981, the minister and departmental officers responsible for the administration of mines and mineral resources in the Northwest Territories and the Yukon were:

Minister:	Hon. John C. Munro
Deputy Minister:	Paul M. Tellier
Assistant Deputy Minister: (Northern Affairs)	G.N. Faulkner

Ottawa

Director, Northern Non-renewable Resources Directorate:	Dr. H.W. Woodward
Chief, Mining Division: (Acting)	T.W. Dent
Head, Mining Resources Section:	D.D. Brown
Evaluation Geologist:	T.W. Caine
Staff Geologist:	A.F. Wilcox
Head, Mining Lands Section:	T.W. Dent
Assistant Head, Legislation:	P.M. Corrigan
Assistant Head, Royalties:	M.A. Fish

Yukon Region

Regional Director:	D. Watson
Assistant Director:	C. Ogilvie
Regional Geologist:	D. Tempelman-Kluit
District Geologist:	J.A. Morin
District Geologist:	J.G. Abbott
Staff Geologist:	R.L. Debicki
Supervising Mining Recorder:	B.R. Baxter
Mining Recorder:	Vacant, Whitehorse
Mining Recorder:	D.F. Jennings, Dawson
Mining Recorder:	R.G. Ronaghan, Mayo
Mining Recorder:	P. McLeod, Watson Lake
Regional Mining Engineer:	D.B. Stewart
District Mining Engineer:	N. Prasad
Mine Rescue Superintendent:	J. Barraclough
Environmental Technician:	D. Cormier
Mining Claim Inspectors:	G. Gilbert
	R. Whittingham
	J. Payne

Northwest Territories Region

Regional Director:	R.W. Hornal
Acting Assistant Director:	R.L. Williams
Regional Geologist:	W.A. Padgham
District Geologist:	P.J. Laporte
District Geologist:	W.A. Gibbins
District Geologist:	J.M. Seaton
District Geologist:	C.C. Lord
Staff Geologist:	J.A. Goodwin
Supervising Mining Recorder:	R.L. Williams
Mining Recorder:	E.D. Cook
Mining Recorder:	H.B. Mercer

Regional Mining Engineer:*

* As of June 1, 1981, Mining Engineering for the Northwest Territories was transferred to the government of the Northwest Territories.

Mining Division

Responsibilities

This division is responsible for defining mineral potential of certain areas in the North related to specific problems, for advising various government agencies on current and proposed mining and exploration developments, for developing mineral policy and mining legislation, and for collecting mining royalties. The division in Ottawa comprises two sections — Mining Resources and Mining Lands.

In the North all mine and mineral responsibilities are handled by regional directors who are responsible for the respective northern affairs programs. Three separate sections are each located in Whitehorse, Yukon, and Yellowknife, Northwest Territories; these include Exploration and Geological Services, Mining Lands, and Mining Engineering and Inspection Services.

Mining Lands

The Mining Lands Section develops policies and initiates and assists in drafting appropriate legislation relating to the administration and disposition of mineral rights in the Yukon and the Northwest Territories. The section is also responsible for the collection of royalties payable from mining operations in the territories.

For administrative purposes, the territories have been divided into seven mining districts. A mining recording staff is responsible for the disposition of mineral rights within each district in accordance with applicable legislation. There is a supervising mining recorder in each territory whose principal function is to ensure that uniform practices are observed in the administration of the various mining acts and regulations.

Mining Resources

The Mining Resources Section maintains a microfilm library on all published geoscientific reports and on unpublished assessment reports for the Yukon and the Northwest Territories. This office's prime concern is assessment and definition of mineral potential of specific commodities and areas in the territories relating to proposals concerning parks, land claims, transportation routes, power developments, etc. This section and the Mining Division as a whole inform and advise the minister on current and proposed mine and exploration developments in the North. Monthly and annual reports in Mines and Mineral Statistics and Mine and Minerals Activities, respectively on the North are produced by the Mining Resources Section for use by the mining industry, public and government.

Exploration and Geological Services sections provide a geological service to the mineral industry in the North. Offices are maintained at Whitehorse and Yellowknife. Two core libraries, the H.S. Bostock library at Whitehorse and the C.S. Lord library at Yellowknife, preserve diamond drill core data. Each has laboratory facilities for core splitting, diamond-saw cutting, thin-section preparation and core storage. Regional and district geologists carry out mineral property examinations, collect rocks and mineral specimens and advise the mineral industry, government departments and research scientists on geological problems. Departmental geologists assist prospectors and other geologists in identifying rock and mineral specimens by giving prospector training courses and preparing geological compilation maps on mineralized areas.

Mining Engineering

This section gives advice on the Mining Safety Ordinances and Mining Safety Rules and Regulations as well as the Blasting Ordinance and Regulations in the Yukon and the Explosives Use Ordinance in the Northwest Territories. It also prepares new safety legislation when required. Regional mining engineers are stationed at Whitehorse and Yellowknife. The senior mining engineer has on his staff a district engineer, an electrical-mechanical engineer, environmental engineer, a mine rescue superintendent, a claim inspector and a clerk. This

team is responsible for inspecting mines, quarries and blasting operations to ensure compliance with safety legislation; for inspecting mineral claims to ensure compliance with the Yukon Quartz Mining Act and the Northwest Territories Canada Mining Regulations; for ensuring that sufficient mine personnel are trained in mine rescue, recovery operations and first aid; for conducting ventilation and dust surveys; for monitoring radioactive contamination; and for carrying out environmental studies of all underground and surface mining properties.

YUKON MINERAL EXPLORATION AND MINING - 1980

LEGEND

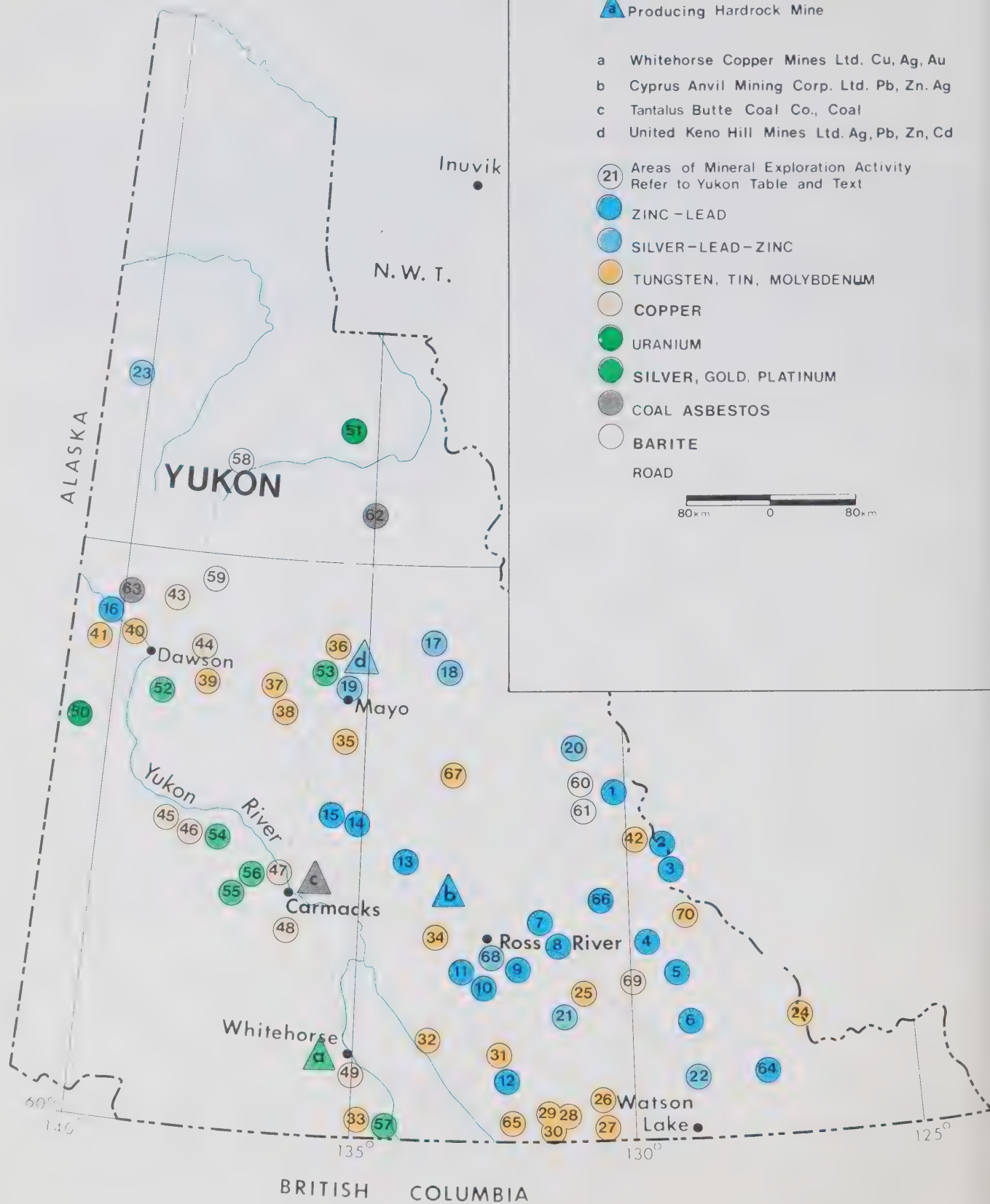


Producing Hardrock Mine

- a Whitehorse Copper Mines Ltd. Cu, Ag, Au
- b Cyprus Anvil Mining Corp. Ltd. Pb, Zn, Ag
- c Tantalus Butte Coal Co., Coal
- d United Keno Hill Mines Ltd. Ag, Pb, Zn, Cd

(21) Areas of Mineral Exploration Activity
Refer to Yukon Table and Text

- (Blue circle) ZINC - LEAD
 - (Light blue circle) SILVER - LEAD - ZINC
 - (Yellow circle) TUNGSTEN, TIN, MOLYBDENUM
 - (Orange circle) COPPER
 - (Green circle) URANIUM
 - (Dark green circle) SILVER, GOLD, PLATINUM
 - (Grey circle) COAL ASBESTOS
 - (White circle) BARITE
- ROAD



Yukon Territory

Mining Production and Development

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Some 1 131 Yukon employees, or 4.5 per cent of the working force are engaged in mining.

Development work continues on a number of properties. Cyprus Anvil Mining Corporation⁽⁶⁾ announced an important expansion program that includes development of two new open pit mines on the Grum and Vangorda ore bodies. By 1985 the Vangorda pit will be mined concurrently with ore from the Faro mine and by 1988 the Grum pit will begin production. The development will extend mining in the Anvil area from 1989 to 1997. The \$240 million program will be spread over

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At Dublin Gulch, Canada Tungsten Mining Corporation⁽⁵³⁾ commenced operations in June with its 1 520 m³ per day placer plant designed to recover fine gold and scheelite.

Cyprus Anvil Mining Corporation

Cyprus Anvil Mining Corporation milled 2 825 000 t in 1980 to produce 195 814 t of zinc concentrate (50.38 per cent zinc), 116 490 t of lead concentrate (56.86 per cent lead) and 13 548 t of combined lead-zinc concentrates (44.41 per cent combined lead-zinc). These figures represent a decrease of about 1 per cent for zinc, 12 per cent for lead and 53 per cent for combined lead-zinc compared to 1979. This was caused by lower ore grade and reduced metallurgical recovery from oxidized ore in the Faro No. 2 deposit.

By-product silver increased to 68 429 kg and gold to 217.7 kg. Cyprus Anvil is the largest silver producer in the Yukon.

Type:	Open-pit
Location:	209 km northwest of Whitehorse
Product:	Zinc, lead, silver, gold
Rate:	7805 t per day
Tonnes milled:	2 825 00
Reserves:	37 000 000 t
Reserve grade:	3.0% lead, 4.4% zinc, 35 g silver per t
Employees:	567

United Keno Hill Mines Limited

United Keno Hill Mines Limited produced silver-lead-zinc from five underground mines: Husky, Keno, No Cash, Ruby and Elsa and two open-pit mines; Sime and Silver King. In addition, lower grade open-pit ore from previously mined Birmingham pit accounted for 33 per cent of the tonnage. In 1980 mine production totalled 79 637 t down 21 per cent from 1979. All production ceased on September 10 when the mine was struck and the strike was still in effect at year-end. Consequently, silver production declined to 51 768 kg during 1980 from 72 178 kg produced in 1979.

Type:	Underground and open-pit
Location:	50 km northwest of Mayo
Product:	Silver, lead, zinc
Rate:	371 t per day
Tonnes milled:	79 637
Reserves:	436 000 t
Reserves grade:	847 g silver per t 3.4% lead
Employees:	330

Whitehorse Copper Mines Limited

Whitehorse Copper Mines Limited mined a higher grade of copper ore from its underground mine near Whitehorse. The ore grade improvement (average of 1.58 per cent copper) resulted in a 35 per cent increase in copper production to 10.7 million kg contained in concentrate. During 1980 a total of 776 000 t of ore was milled. Silver production increased 40 per cent from the previous year to reach 5 256 kg while gold production increased 37 per cent to reach 493.5 kg (contained in concentrate).

Type:	Underground
Location:	11 km south of Whitehorse
Product:	Copper, gold, silver
Rate:	2319 t per day
Tonnes milled:	775 642
Reserves:	1 674 545 t
Grade:	1.40% copper
Employees:	211

Tantalus Butte Coal Company

Tantalus Butte Coal Company at Carmacks continued to mine coal for a short period during the summer of 1980. Coal from the mine is stockpiled and is delivered to the Cyprus Anvil Mine as a backhaul by trucks that transport lead and zinc concentrates to Whitehorse. Cyprus Anvil Mines, owner of the mine, use the coal for drying lead and zinc concentrates at the Faro concentrator.

Type:	Open-pit
Location:	Carmacks
Product:	Subbituminous Coal
Rate:	Approximately 276 t per day for 60 operating days
Tonnes produced:	16 539
Reserves:	Not available
Employees:	10 (seasonal basis)

Small Lode Mines

In recent years a number of small lode mines have been developed in the Yukon to mine high grade silver-bearing lead veins.

The PJJ Mining (Casino Mine) mine resumed operations in mid-January, 1980 with commencement of underground mining. Later in the year the company trenched silver-lead-zinc veins on surface. Operations ceased on December 15 for the Christmas break. The mine employed up to six persons during peak operations. The company is reported to have shipped at least 73 t of argentiferous galena. This was less than the 90 t shipped in 1979.

The Silver Arrow Syndicate (Canol Mine) operated the lead-zinc-silver mine with a seven-man crew from late

June until late September. The company reports shipping 230 t of argentiferous galena to a smelter. Production in July was reported to be 62.2 kg of gold and 22.68 t of lead. In 1979 the company reported shipping 780 t of ore.

Mineral Exploration

Mineral claims staked and recorded in the Yukon Territory during the year, with comparative figures for 1979 are:

Districts	Claims Recorded	
	1980	1979
Whitehorse	3 281	1 942
Dawson	2 091	2 175
Mayo	2 253	3 197
Watson Lake	3 545	4 012
Total	11 170	11 326

In addition 3 632 placer claims and 938 placer leases, largely in the Dawson District were registered; this compares to 1979 figures of 2 479 placer claims and 446 placer leases.

Exploration activity in the Yukon continued at a strong pace with emphasis on drilling and intensive property evaluation. Expenditures increased from \$27 million in 1979 to \$39.4 million during 1980, an increase of 45 per cent. Exploration projects in 1980 continued to reflect interest in tin, tungsten and molybdenum, and lead and zinc continued strongly as in previous years. Emphasis on uranium exploration has all but disappeared. The most significant change was the increased emphasis on precious metals, particularly gold and much work here was focused on the Dawson Range.

A summary of exploration completed by the various exploration and mining firms is given in Table II. The location of these exploration activities are given a common number on the table and are illustrated on the map, Yukon Mineral Exploration and Mining, 1980.

Lead-zinc

South of Ross River, Noranda Mines Limited drilled 500 m in 5 holes in the old Canol Mines property⁽¹¹⁾ near Seagull Lakes to examine the shales beneath the carbonate that hosts the original lead-zinc-silver showing. Northeast of Watson Lake, Noranda Mines Limited drilled 2 000 m in 25 holes on the Quartz Lake⁽⁶⁴⁾ stratabound lead-zinc deposit.

As part of a joint venture between Aquitaine Company of Canada Limited, Union Oil Limited and St. Joseph Exploration Limited, Archer, Cathro and Associates Limited drilled four holes totalling about 1 000 m on the ABBEY claims⁽²⁾, located some 40 km northwest of Howards Pass. The prospect is underlain by a thick zone of Ordovician to Silurian shale with a zone containing about 0.3 per cent combined lead and zinc.

Hudson Bay Exploration and Development Company optioned a property near Pelly Banks⁽⁸⁾ for a possible lead-zinc target and carried out gravity and EM surveys. The company continued its interest and staked the BIG claims in the area.

In 1979, Conwest Exploration Company Limited and Essex Minerals discovered the Clear Lake⁽¹⁴⁾ lead-zinc deposit, 80 km northwest of Faro. In 1980, Getty Mines Limited and U.S. Steel Corporation acquired the prospect from Conwest Exploration. The companies completed 110 km of gravity and EM ground surveys but did no further drilling.

On the TUM group⁽¹⁵⁾ west of Getty's Clear Lake deposit, Cominco Limited carried out EM and gravity surveys with geological mapping. The results are inconclusive. The company also drilled six holes for a total of about 700 m on its FIN prospect⁽⁴⁾ north of Frances Lake and BARB claims⁽⁵⁾ of Sovereign Metals (formerly Matt Berry) east of Findlayson Lake. The latter was drilled to test a lead-zinc target in black shales. On the JASON property⁽¹⁾ in the MacMillan Pass area, Pan Ocean Oil Limited followed up gravity and geochemical work with trenching and 5 000 m of diamond drilling. Altogether 12 holes were drilled mostly on new targets.

Tungsten-Tin-Molybdenum

Canada Tungsten Mining Corporation Limited through its operator Bema Industries investigated a tungsten skarn at the head of Ray Gulch on Potato Hills⁽³⁶⁾ north of Mayo. The presence of high grade tungsten float in Ray Gulch was known in 1944 and the search for its source has continued since. In 1979, Canada Tungsten drilled 18 widely spaced holes in the skarn immediately south of the stock, and each hole intersected scheelite mineralization — with possible reserves of 4.5 million t of 0.5 per cent tungsten trioxide.

In the 1980 program, about 1 100 m in 64 holes, continued to focus on the highly sheared regionally metamorphosed skarn.

In a third summer of serious investigation, Hudson Bay Exploration drilled 16 holes totalling 2 162 m on the Risby Tungsten Mines CAB claims⁽³⁴⁾ in the Pelly Mountains. Earlier drilling showed that two pyrrhotite-diopside-scheelite skarns extended along strike for 660 m and to a depth of 250 m. The 1980 drilling focused on the northerly extension of the skarn.

On the CLEA prospect⁽⁴²⁾, near the Yukon-Northwest Territories border, Placer Development Limited and U.S. Steel Corporation drilled 33 holes for a total of 1 500 m to test a scheelite bearing skarn.

Other companies seeking tungsten were Noranda Mines Limited which did extensive geological and geophysical work on the RAIL group⁽⁴⁰⁾ northwest of Dawson, Rio Tinto Canadian Exploration which did a geochemical survey on its IDA claims⁽³⁹⁾ northeast of Dawson and Archer, Cathro and Associates Limited which drilled its BOOT and MARMOT claims⁽²⁵⁾ in the Pelly Mountains.

Explorations for tin has been concentrated in the Swift River and Mayo areas of the Yukon. On the JC group⁽³⁰⁾, 30 km northwest of Swift River, the DC Syndicate, a joint venture of Dome Petroleum and Cominco Limited field managed by J.C. Stephen Explorations Limited, drilled 14 holes totalling 900 m. The Syndicate also worked on the MW, ZINC, PLUG, CAN, MUN and ROAD claims, all tin targets in the Seagull Batholith area. On the BAR group⁽¹²⁾ 80 km northwest of Swift River, the Syndicate drilled 350 m in four holes to test a pyritic barite horizon with low lead-zinc and silver values.

Duval Corporation and Dupont of Canada Exploration, in a joint venture drilled seven holes for a total of 1 500 m on their MC and DU claims⁽²⁹⁾ near Swift River. This program is a continuation of work begun in 1979 and the results justify more drilling in 1981. Three bulk samples of a 7 m wide section of one mineralized zone averaged 0.42 per cent tin.

Cominco Limited continued its regional tin reconnaissance in the McQuestin River-Clear Creek area⁽³⁷⁾ with detailed prospecting and soil sampling, and Canada Tungsten Mining Corporation, through its operator Bema Industries Limited, investigated a cassiterite occurrence on Tin Dome⁽³⁶⁾ north of Mayo. Further work is planned in 1981. CCH Resources Limited investigated several claim groups⁽³⁸⁾ in the McQuestin and South Klondike rivers.

The search for molybdenum was continued in 1980 by several companies. A major program was continued for the third summer by Tintina Mines and Amoco Canada Petroleum Company on the Red Mountain property⁽³²⁾, 80 km northwest of Whitehorse. In 1980, a 6 000 m drilling program at Red Mountain was completed. Fill-in drilling progressed well and showed mineralization for more than 1 200 m depth, disseminated in fractures in altered Cretaceous quartz monzonite.

Pan Ocean Oil Limited, Amax Exploration and Serem Limited conducted a joint venture on the FIDLER prospect⁽²⁷⁾ at Boulder Creek, 80 km west of Watson Lake and the same companies worked together on several other claims in the Meister River area in a project managed by Cordilleran Engineering. Placer Development Limited drilled on the CLOUD claims⁽³³⁾ on Windy Arm, south of Whitehorse, on a molybdenite in granitic rocks target.

Gold-Silver

Gold and silver have long played a key role in Yukon mining and activity has been increased as prices soared over the past two years.

Among the companies involved in the search for gold are Noranda Mines Limited, which drilled the old Emmons Hill property, an antimony-gold-bearing quartz veins on Freegold Mountain⁽⁵⁶⁾ west of Carmacks. Working nearby on the Laforma property⁽⁵⁵⁾, Archer, Cathro and Associates reported encouraging results from preliminary geochemical survey work and also from a regional prospecting program in the Dawson Range, carried out as part of the Nat Joint Venture.

United Keno Hill Mines Limited conducted a reconnaissance program on Montana Mountain⁽⁵⁷⁾ and Bema Industries (Cantung) trenched gold-bearing quartz arsenopyrite veins on the northside of the Dublin Gulch⁽⁵³⁾ stock. Hudson Bay Exploration, Cominco Limited⁽⁵²⁾ and Dawson Eldorado Gold Explorations were also active in the Dawson area.

Placer activity, expectably concentrated in the Dawson mining district, increased substantially over 1979. About 7 500 claims, nearly double the number of two years ago, were in good standing in the district in December 1980.

The main new effort in many placer mining operations is to eliminate more of the coarse-sized gravel from the separating circuit and a variety of grizzlies and screens have been employed to effect this.

Gold Creek Mining Limited reported on its new placer gold mine at Rude Creek. During a 550-hour period of sluicing, 28.6 kg of crude gold were recovered. Refining operations indicate the crude gold contains 80.7 per cent gold and 11.2 per cent silver.

Several major companies were investigating silver prospects during the field season. Prism Resources Limited carried out an extensive program, 69 km northeast of Keno Hill with 43 drill holes on its VERA claims⁽¹⁷⁾ and another nine holes on the nearby VAL group for a total of 4 300 m. About 272 000 t of drill indicated reserves have been blocked out on the VERA silver-lead prospect. An adit is being considered for 1981.

On Mount Hundere⁽²²⁾, 55 km north of Watson Lake, Cima Resources Limited drilled about 1 300 m to test for extensions of its lead-zinc-silver deposit. The company has awarded a contract for a final feasibility study

to determine the economics of mining the proven reserves of 131 000 t of 13.6 per cent lead, 16.2 per cent zinc and 70.29 g per t silver with probable reserves of 9 000 t grading 12.4 per cent lead, 14.4 per cent zinc and about 90 000 t with 3.5 per cent lead, 8.7 per cent zinc and 113.51 g per t silver.

On its property 200 km east of Whitehorse, Tintina Mines⁽²¹⁾ exposed the number 8 vein for a length of 150 m. The property includes a number of strong silver-lead veins in Lower Cambrian marble. Silver-lead ratios are near 2:1, and in the Yukon are second only to those at Keno Hill.

United Keno Hill Mines tested the LEO-KPO claims⁽¹⁹⁾ on Galena Hill with 20 holes totalling 1 500 m of diamond drilling. They were successful in drilling off an extension 1 000 m southwest of the Husky vein with 1 820 m of diamond drilling in nine holes. In the southwest extension the vein is about 30 m wide with pyrite over the entire width. The company also overburden drilled 259 holes totalling 11 200 m in other parts of its camp and have defined new ore mineable from surface above the old Silver King (Galena Hill), Lucky Queen (Keno Hill) and Bellekno Mines. On Mount Hinton it drilled about 2 000 m of percussion holes.

Rio Alto Exploration Limited drilled 26 holes for a total of 1 200 m on its Rusty Springs property⁽²³⁾ about 180 km north of Dawson. The mineralization is widespread, but spotty and individual showings are of limited size.

On its CRAIG, ROD and SIAN prospects⁽¹⁸⁾ south of Nadaleen Mountain and 130 km northeast of Mayo, Canadian Superior Exploration drilled 14 holes for a total of 2 300 m.

Silver Tusk Mines completed a 119 m of adit work and cross cutting on its Carmacks area silver-gold property⁽⁵⁶⁾. The reserves were previously reported at 766 364 t grading 2.6 g per t gold, 183.0 g per t silver, 4.71 per cent lead, 6.0 per cent zinc and 0.35 per cent copper.

Copper

Copper was the main target in exploration programs carried out by Noranda Mines Limited on the TAH claims⁽⁴⁸⁾ southwest of Carmacks and the LETA claims on Cow Creek in the Dawson Range; Cominco Limited which staked the BATTLE claims⁽⁴⁵⁾ in the Dawson Range; and Whitehorse Copper Mines which drilled 41 holes for a total of about 7 000 m in the Whitehorse Copper Belt⁽⁴⁹⁾.

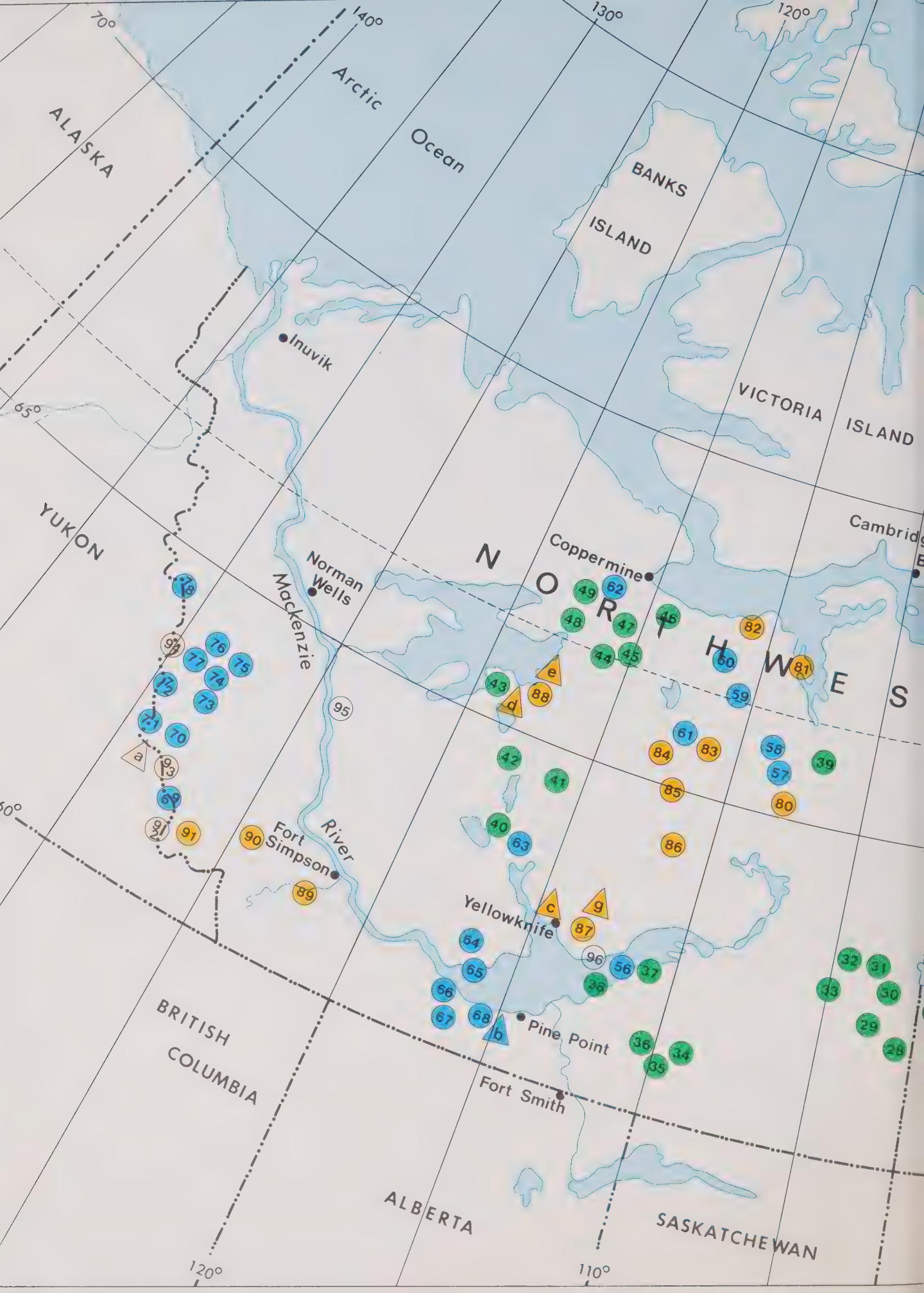
United Keno Hill Mines drilled on the STU claims⁽⁴⁷⁾ between the Minto and Williams Creek copper showings to examine an occurrence discovered late in 1978. Altogether about 5 000 m were drilled in 28 holes. Isolated good grade intersections were cut in three holes but the remainder of the mineralized rock intersected grades between trace copper to 0.49 per cent over 17 m.

Anaconda Canada Exploration drilled the THOR prospect⁽⁴⁴⁾ west about 80 km east-northeast of Dawson as well as working on the STYX claims⁽⁴⁴⁾ north of Dawson.

Uranium

Cordilleran Engineering carried out a hand trenching program on the NOR claims⁽⁵¹⁾ in the Richardson Mountains where coarsely crystalline brannerite is exposed in part of a breccia pipe that cuts Proterozoic rocks.

Eldorado Nuclear drilled seven holes totalling 945 m on its JOVE claims⁽⁵⁰⁾, 40 km southwest of Dawson on



MINERAL EXPLORATION AND MINING NORTHWEST TERRITORIES — 1980

100 km 0 100 km

LEGEND



Producing Mines

- a Canada Tungsten Mining Co. Ltd., W, Cu
- b Pine Point Mines Ltd., Pb, Zn
- c Giant Yellowknife Mines Ltd., Au, Ag
Cominco Ltd.(Con-Rycon Mines) Au, Ag
- d Terra Mining & Exploration Ltd., Ag
- e Echo Bay Mines, Ag, Cu
- f Nanisivik Mines Ltd., Pb, Zn
- g Camlaren Mine, Au

Road

12 Areas of Exploration Activity
Refer to N.W.T. Table and Text



URANIUM



GOLD, SILVER



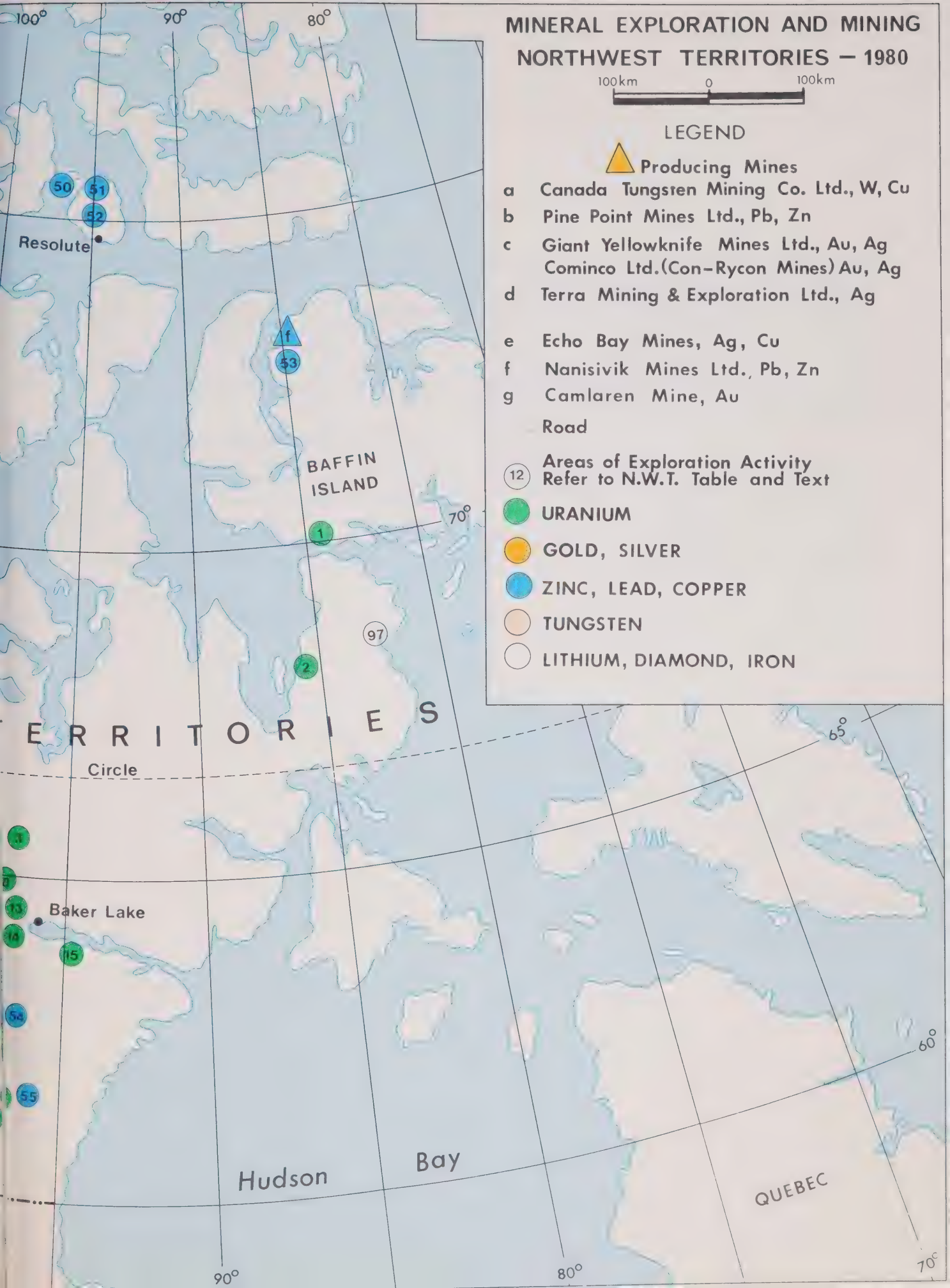
ZINC, LEAD, COPPER



TUNGSTEN



LITHIUM, DIAMOND, IRON



Matson Creek. A uranium rich spring and meta-autunite in fractures within the Pelly Gneiss are being investigated by the drilling.

Barite

Baroid of Canada Limited drilled nine holes totalling about 1 000 m on its CATHY property⁽⁶⁰⁾ 25 km west of MacMillan Pass and outlined 450 000 t of commercial grade barite.

Hudson Bay Exploration and Development did follow up geochemistry in search for barite occurrences in the same general area.

Milchem Incorporated trenched, drilled and removed two 1 300 kg bulk samples for test milling from the

REIN property⁽⁵⁹⁾ located approximately 100 km up the Dempster Highway. Milchem also drilled about 500 m and surface trenched to remove a 450 kg bulk sample from the KAREN claims⁽⁵⁸⁾.

On Yukon Barite Company Limited's TEA deposit⁽⁶¹⁾, Milchem Incorporated mined 900 t of barite.

Asbestos

Archer, Cathro and Associates continued its regional asbestos reconnaissance program with encouraging results in the Clinton Creek-Dawson area where the TJOP, TITO and TOC claims⁽⁶³⁾ cover new asbestos occurrences within serpentinite bodies. The search for asbestos was expanded into the Finlayson Lake area, an extension of the Dawson district displaced by the Tintina Fault.

Mining Production and Development

Metal mining production in the Northwest Territories during 1980 was valued at \$446 million, including tungsten which was valued at approximately \$68 million. Metal production came from eight mining establishments that produce zinc, lead, tungsten, gold, silver, copper and cadmium.

The Northwest Territories accounted for almost 100 per cent of the tungsten, 20.1 per cent of the lead, 22.0 per cent of the zinc, 9.0 per cent of the gold, and 4.4 per cent of the silver production in Canada. In 1980 the Northwest Territories accounted for 1.4 per cent of total Canadian mineral production and 4.6 per cent of Canadian metal production.

There were 1 950 employees or 6.8 per cent of the Northwest Territories work force engaged in mining.

Projections to late 1981 early 1982 indicate that at least four additional underground mines will be producing in the Northwest Territories. These are Cadillac Explorations Limited's Prairie Creek Mine, the Cullaton Lake Gold Mine, Echo Bay's Lupin Mine, and Cominco Limited's Polaris Mine.

In the Nahanni region, Cadillac Explorations Limited⁽⁹⁰⁾ is developing a \$35 million underground mine at its Prairie Creek lead-zinc-silver deposit for initial production by late 1981. During 1980, a winter road was built from the mine to the Mackenzie Highway southeast of Fort Simpson and mine development work was carried out. Cadillac has sold a 40 per cent working interest in the Prairie Creek project to Procan Explorations Company for \$55 million.

Cullaton Lake Gold Mines, a joint venture of Consolidated Durham Mines and Resources Limited and

O'Brien Energy and Resources Limited is developing its mine⁽⁷⁹⁾ in the Cullaton Lake area, Keewatin District with a program of 2 600 m of underground advance and 6 100 m of underground drilling. The company has announced a financing agreement with Inuit Development Corporation that will provide \$25 million to bring the property into production in the summer of 1981. Drill indicated reserves are 285 000 t grading 25.37 g per t gold.

IU International Corporation through its wholly-owned subsidiary Echo Bay Mines Limited, will bring its Lupin⁽⁸³⁾ gold property at Contwoyto Lake, 300 km east of Port Radium, into production in late 1982. Some \$10 million of the \$100 million development program has already been spent on exploration and preliminary development work. The deposit has been probed by a 1 060 m decline ramp and the company has expanded its airstrip to handle Hercules aircraft. Initial milling capacity will be 900 t per day. Known reserves of 2.45 million t grading 13 g gold per t give the mine a life expectancy of seven years. Prospects for additional ore are good.

Cominco has started development of its \$150 million Polaris⁽⁵⁰⁾ lead-zinc mine on Little Cornwallis Island in the Arctic Islands. Polaris will be the most northerly mine in the world. The mine's annual production, an estimated 170 000 t of zinc concentrate and 38 000 t of lead concentrate will be shipped in ice-breaking and ice-strengthened vessels during the summer navigation season in arctic waters. Initial production is expected early in 1982, and the 2 000 t a day mill will be floated on a barge from Lauzon, Quebec to the mine area in 1981. Ore reserves are estimated at 23 million t averaging 14.1 per cent zinc and 4.3 per cent lead.

Canada Tungsten Mining Corporation

Canada Tungsten Mining Corporation operated above rated mill capacity of 900 t per day throughout the year. In 1980, production was 4 650 000 kg of tungsten trioxide (WO₃) contained in concentrate, an increase of 43 per cent from the previous year.

Increased production and slightly higher prices for WO₃ led to increased revenue in 1980.

Type:	Underground
Location:	Tungsten, Northwest Territories
Product:	Tungsten
Rate:	1 003 t per day
Tonnes Milled:	349 000
Reserves:	3 600 000 t
Reserve Grade:	1.55 per cent tungsten trioxide
Employees:	220

Cominco Ltd. (Con Mine)

Cominco Limited's Con Mine produced 3 015 kg gold and 678.7 kg silver during 1980 from 192 322 t of ore.

Type:	Underground
Location:	2.4 km south of Yellowknife
Product:	Gold, silver
Rate:	525 t per day
Tonnes Milled:	192 322
Reserves:	1 995 796 t
Reserve Grade:	16.8 g gold per t
Employees:	325

Giant Yellowknife Mines Limited

Giant Yellowknife Mines Limited produced ore from underground and open-pit operations. In 1980, production was 1 191 kg gold, a drop of 49 per cent from the previous year. Milled ore declined to 206 148 t in 1980 from 377 619 t in 1979 because of work stoppages in April and a strike from July 10 to October 24.

Type:	Underground
Location:	2.4 km north of Yellowknife
Product:	Gold, silver
Rate:	880 t per day
Tonnes milled:	206 148
Reserves:	1 818 896 t
Reserve grade:	6.53 g gold per t
Employees:	320

Noranda Mines Limited (Camlaren Mine)

Noranda Mines Limited and its subsidiary Pamour Porcupine Mines Limited reopened the Camlaren gold mine leased from Discovery Mines Limited, at Gordon Lake, 100 km northeast of Yellowknife. The installation of the 135 t per day mill and development of the mine to the 318 m level were completed in July at a cost of \$900 000. The mill processed 11 142 t of ore to produce a concentrate containing 147 366 g gold and 40 154 g silver. The property has an estimated production life of about three years.

Type:	Underground
Location:	100 km northeast of Yellowknife
Product:	Gold, silver
Rate:	68 t per day
Tonnes milled:	11 142
Reserves:	27 500 t
Reserve grade:	18.04 grams gold per t
Employees:	54

Echo Bay Mines Limited

Echo Bay Mines Limited continued production from the Eldorado Mine and produced ore from the Contact Lake Mine leased from Ulster Petroleum. A total of 36 531 kg of silver and 267 320 kg of copper were produced from 36 592 t of ore. Silver production declined by 41 per cent compared to 1979.

Type:	Underground
Location:	Port Radium
Product:	Silver, copper
Rate:	109 t per day
Tonnes milled:	36 592
Reserves:	Not available
Employees:	135

Terra Mining and Exploration Limited

Terra Mining and Exploration Limited and Norex Resources had substantially lower production from their mining properties at Camsell River. In 1980, production amounted to 7 584 kg of silver and 212 042 kg of copper from 27 910 t of ore compared with 11 201 kg of silver and 294 958 kg of copper from 31 021 t of ore in 1979. Terra has been involved in an extensive exploration program investigating favourable zones and extensions of known veins.

Type:	Underground
Location:	16 km south of Great Bear Lake
Product:	Silver, copper, bismuth
Rate:	86 t per day
Tonnes milled:	27 910
Reserves:	Not available
Employees:	55

Nanisivik Mines Limited

Nanisivik Mines Limited milled 435 147 t of ore in 1980 to produce 53 749 t of zinc in concentrate and 3 443 t of lead in concentrate, a decrease of 30 per cent for zinc and 45 per cent for lead from 1979. The decrease was due to lost operating days resulting from concentrator foundation problems.

Type:	Underground
Location:	29 km northeast of Arctic Bay
Product:	Zinc, lead, silver, cadmium
Rate:	1 524 t per day
Tonnes milled:	435 147
Reserves:	4 700 000 t
Employees:	220

Pine Point Mines Limited

Pine Point Mines Limited increased its mill tonnage to 3 289 435 t in 1980 from which it produced 143 033 t of zinc in 285 399 t of zinc concentrate and 51 566 t of lead in 74 207 t of lead concentrate. However, metal production declined by 5 per cent for zinc and 4 per cent for lead from 1979.

Type:	Open-pit
Location:	South shore of Great Slave Lake 80 km east of Hay River
Product:	Lead, zinc
Rate:	9 258 t per day
Tonnes Milled:	3 289 435
Reserves:	41 300 000 t
Employees:	610

Mineral Exploration

Mineral claims staked and recorded in the Northwest Territories during the year, with comparative figures for 1979 are as follows:

Districts	1980		1979	
	Claims Recorded	Area (Hectares)	Claims Recorded	Area (Hectares)
Mackenzie	487	306 633	780	579 937
Arctic and Hudson Bay	773	534 552	528	454 961
Nahanni	71	25 244	42	17 093
Total	1 331	866 429	1 350	1 051 991

Exploration expenditures in 1980 are estimated at \$30 million, about 50 per cent of which was spent on drilling programs. As in recent years exploration projects were heavily directed toward uranium, Mississippi Valley type lead-zinc deposits and precious metals. Surface drilling totalled 224 731 m to October 1980, with 35 per cent of the work concentrated on lead-zinc deposits in the Pine Point District. Uranium exploration has reached the drill-test stage in many areas and uranium accounted for 25 per cent of all drilling, of which 75 per cent was in the Keewatin District. Continued high prices for precious metals resulted in a high level of drilling primarily in Slave Province.

A summary of exploration completed by the various exploration and mining firms is given in Table III. The location of these exploration activities are given a common number on the table and are illustrated on the map, Mineral Exploration and Mining, Northwest Territories, 1980.

Uranium

Uranium exploration continued largely in Proterozoic basins containing sediments and metasediments known to contain several styles of uranium deposits. The main areas of uranium exploration include: Baker Lake-Thelon River, Yathkyed Lake, Nonacho Lakes, Melville Peninsula, Baffin Island north of Fury and Hecla Straits, and Coppermine-Dismal Lakes. Activity also occurred in the East Arm, Great Slave Lake and south of Great Bear Lake.

Several significant uranium deposits, including the Lone Gull (Urangesellschaft)⁽¹⁴⁾, Amer Lake (Aquitaine)⁽³⁾ and the 68-2 and 8 (Pan Ocean Oil)⁽¹⁵⁾ have been discovered in the Baker-Dubawnt area over the last few years.

During 1980 additional uranium mineralization was outlined in the Baker Lake area. Urangesellschaft Canada Limited continued to drill its Lone Gull deposit⁽¹⁴⁾ and to extend the dimension of mineralization. In 1979, the deposit was estimated to contain an indicated 9.1 million kg of uranium oxide (U_3O_8) on the basis of the first 40 drill holes. In 1980, Urangesellschaft completed 9 000 m of diamond drilling on the Lone Gull property, 2 500 m in the Judge Sissons Lake area and 400 m in the Marjories Lake area.

Pan Ocean Oil drilled more than 6 000 m southeast of Baker Lake in the Bissett Lake — Martell Lake area⁽¹⁵⁾. Significant uranium mineralization was found in five holes in a brecciated zone associated with a strong fault system separating Kazan sandstone and basement rocks.

Lead-Zinc-Copper

In base metals exploration, Cominco Limited drilled 18 holes totalling 1 265 m in the Main A — Zone deposit⁽⁵⁸⁾ of the Bathurst Norsemes Limited property, Hackett River area. The drill program outlined continuity of the zinc-silver-lead-copper mineralization.

Nanisivik Mines Limited continued its exploration program for lead-zinc near Strathcona Sound⁽⁵³⁾ and Cominco Limited drilled on claims near the Taylor River⁽⁵¹⁾ and Allan River⁽⁵²⁾, Cornwallis Island and on new permits on northern Cornwallis Island. In the Pine Point area⁽⁶⁸⁾, Pine Point Mines announced that it had conducted a major diamond drilling program that had delineated 5.4 million t of 10-12 per cent combined lead-zinc ore on a separate reef zone near the northern boundary of its claims near Pine Point. Western Mines Limited also completed its 1979-80 winter drilling program on its Slave reef project⁽⁶⁸⁾.

In the Mackenzie Mountains, Rio Tinto Canadian Exploration Limited drilled 2 007 m on the VULCAN property⁽⁷⁰⁾ in addition to extensive prospecting and geophysical surveys. Rio Tinto also did extensive geological and geochemical surveys and 300 m of drilling of the spectacular MAJESTY property⁽⁷³⁾. The company reported a best assay of 43 per cent combined lead-zinc for a chip sample across 8 m.

Several other companies including Noranda, Canadian Nickel, Logan Mines and Welcome North explored various claim groups in the Mackenzie Mountains for lead and zinc. Shell Canada carried out regional geological surveys for copper in the Keele River area⁽⁷⁵⁾.

Tungsten

Union Carbide drilled 4 700 m to further test the LENED⁽⁹³⁾ scheelite-bearing skarn deposit. The company also investigated the IVO⁽⁹²⁾ and VC⁽⁹³⁾ claims.

Canada Tungsten prospected the Baker Prospect⁽⁹³⁾ near Tungsten and Amax added the PINA and FALCON claims⁽⁹⁴⁾ to the Mactung deposit at MacMillan Pass.

Silver

The Bear Province was the main area of silver exploration in 1980. Underground and surface drilling continued at Terra Mining and Exploration Limited's Silver Bear Mine and at Echo Bay Mine's Eldorado Mine, Contact Lake and El Bonanza prospects⁽⁸⁸⁾.

Gold

In the Slave Province, exploration for gold was the main interest and drilling was carried out by Canuc Resources, Texasgulf Incorporated, Giant Yellowknife Mines Limited, Cominco Limited, Goldfields Corporation, Noranda Exploration Company Limited and Hidden Lake Mines Limited.

Tantalum-Columbium-Lithium

In the Yellowknife-Beaulieu River area, Placer Development Limited drilled the Highwood Resources Limited THOR claims. The drilling outlined extensive deposits of tantalum and columbium near Thor Lake⁽⁹⁶⁾. Several lithium-bearing pegmatites were prospected in the Beaulieu River area⁽⁹⁶⁾.

Iron

Borealis Exploration Limited has resumed work on its iron properties on the Melville Peninsula⁽⁹⁷⁾ with environmental and laboratory metallurgical studies.

Mining Safety Statistics

There was one fatal mining accident during 1980 in the Yukon. The fatality at United Keno Hill Mines was due to a rock fall from the back of a subdrift that occurred during a rockbolting operation. There were, however, 101 disabling injuries that caused the loss of 8 467 person days. Person strain while lifting caused most of the disabling injuries. Other causes were persons falling⁽¹¹⁾; foreign matter in eyes⁽⁵⁾; struck by moving object⁽⁵⁾. These causes accounted for 46 per cent of all injuries.

There were two fatal mining accidents during 1980 in the Northwest Territories. One of the fatal accidents was caused when a person was caught between a locomotive and ventilation door frame at the Echo Bay Mine in January. The second was in November at Pine Point Mines, when a dozer operator was run over by his machine. There were 185 disabling injuries that caused the loss of 16 458.5 person days. The main causes of disabling injuries were strain while lifting⁽³⁵⁾; fall of persons⁽³⁰⁾; caught between two objects⁽²¹⁾; struck by moving objects⁽¹³⁾. These accidents accounted for 46 per cent of all injuries.

MINERAL PRODUCTION CHART - 1971 - 1980 TABLE I
PRODUCTION DES MINÉRAUX - 1971 - 1980 TABLEAU I

NORTHWEST TERRITORIES - TERRITOIRES DU NORD-OUEST

MINERAL MINÉRAUX		1971	1972	1973	1974	1975	1976	1977	1978	1979	1980(a)
Gold - Or	\$	10 897 934	17 713 250	24 262 894	28 651 414	28 754 047	24 390 081	31 336 428	45 769 718	61 868 488	91 974 204
g - (gr)		9 590 415	9 563 666	7 747 098	5 737 565	5 460 651	6 162 252	6 204 583	6 458 948	5 355 926	4 353 393
Silver - Argent	\$	4 474 616	6 778 965	13 961 789	17 669 851	8 883 385	14 343 774	18 716 934	23 854 173	34 770 651	35 663 878
g - (gr)		91 209 266	126 257 130	168 591 544	118 728 409	61 319 168	103 794 822	118 325 557	120 237 000	83 358 000	45 109 000
Copper - Cuivre	\$	727 595	577 416	1 106 319	840 719	526 889	639 980	445 850	518 993	941 732	1 257 526
kg - (kg)		626 060	514 268	786 610	491 923	374 885	424 469	291 959	315 624	397 191	479 362
Nickel - Nickel	\$										
kg - (kg)											
Lead - Plomb	\$	22 629 795	27 838 277	32 261 787	34 932 761	37 254 292	26 440 157	40 833 313	56 898 673	80 117 935	60 091 957
kg - (kg)		76 034 832	81 846 189	90 667 291	76 524 844	83 390 558	52 942 453	58 832 599	70 088 814	60 645 969	55 008 800
Zinc - Zinc	\$	75 056 384	64 792 006	87 541 226	132 251 480	106 650 304	122 438 035	125 104 245	143 911 352	205 600 051	189 149 892
kg - (kg)		203 496 733	154 103 925	164 449 732	171 886 138	129 002 037	147 610 457	159 709 355	187 809 913	213 323 454	196 781 500
Uranium - Uranium	\$								250		
kg - (kg)											
Cadmium - Cadmium	\$	301 476	205 436	61 152		1 027	3 179	2 677			
kg - (kg)		70 488	36 832	7 620		137	549	386			
Bismuth - Bismuth	\$	41 149									
kg - (kg)		3 437									
Tungsten - Tungstène	\$									53 675 858	68 324 360
kg - (kg)		1 491 593	1 439 757	1 464 468	1 613 700	1 477 731	2 158 154	2 284 409	2 885 619	3 254 067	4 650 000
TOTAL	\$	114 228 949	177 905 350	158 925 167	214 346 225	182 069 944	188 254 206	216 439 447	270 952 909	436 974 715	446 461 817

YUKON TERRITORY											
YUKON											
Gold - Or	\$	511 534	234 983	2 032 502	4 111 631	5 255 077	4 401 075	4 656 118	8 518 731	13 749 271	63 029 261
g - (gr)		450 161	126 871	648 974	823 371	997 986	1 111 949	921 907	1 202 149	1 190 268	2 982 600
Silver - Argent	\$	8 966 417	8 331 575	15 342 856	26 800 905	28 531 397	12 809 321	20 154 760	28 462 559	54 218 064	99 150 394
g - (gr)		178 773 547	155 174 219	188 921 678	180 082 381	196 943 109	92 697 630	127 415 268	143 459 000	129 982 000	125 451 000
Lead - Plomb	\$	29 340 379	34 392 366	38 013 324	41 194 600	54 888 680	15 999 040	47 627 667	64 322 403	103 374 279	73 018 790
kg - (kg)		98 582 016	101 115 601	106 831 187	90 242 227	122 863 633	32 035 681	68 621 899	79 233 298	78 250 062	66 843 000
Copper - Cuivre	\$	2 709 696	890 286	14 791 665	15 571 426	11 928 559	16 045 963	8 953 814	16 474 354	18 442 058	20 788 869
kg - (kg)		2 327 836	792 922	10 517 104	9 111 183	8 487 245	10 642 540	5 843 210	10 018 826	7 778 231	7 935 000
Coal - Charbon	\$										
tonnes -		19 074	16 724	17 782	15 447	23 326	9 046	18 779	16 578	23 003	16 539
Zinc - Zinc	\$	39 003 342	45 341 287	61 167 027	60 899 995	95 400 540	39 233 926	80 562 287	74 076 827	109 460 866	87 410 896
kg - (kg)		105 747 869	107 603 704	114 904 734	79 151 212	115 394 553	47 300 153	102 846 637	96 673 141	113 572 783	90 938 000
Cadmium - Cadmium	\$	114 654	82 759	45 718	17 331	15 423	13 220	11 595	355		
kg - (kg)		26 807	14 837	5 697	1 977	2 050	2 284	1 670	58		
Asbestos - Amiante	\$	12 374 380	13 006 476	13 915 140	22 752 400	32 820 720	35 310 723	47 493 872	26 948 800		
tonnes -		84 433	92 431	91 384	82 459	103 735	103 431	95 590	53 255		
Nickel - Nickel	\$		3 996 762	5 209 621							
kg - (kg)			1 276 691	1 544 473							
Platinum - Platine	\$		325 573	149 458							
g - (gr)			112 750	40 870							
TOTAL	\$	93 020 402	106 502 067	150 667 311	171 348 288	228 840 396	123 813 268	209 460 113	218 804 029	299 244 538	343 398 210

(a) Preliminary Figures
Valeurs préliminaires

Exploration and Mine Development Stages as Depicted in Tables II and III

	STAGE	ACTIVITY (in part or total)	PURPOSE
1	Reconnaissance Exploration	Stream sediment and water sampling; reconnaissance geological mapping and prospecting; airborne geophysical surveys: radiometric, electromagnetic and magnetic; Staking.	To locate anomalies. An anomaly is an area of the earth having properties which deviate from normal. A lake having unusual amounts of uranium in the bottom sediments, or rocks with high electrical conductivity are examples of anomalies.
2	Detailed Ground Follow-up	Detailed soil geochemical surveys; radiometric, magnetic, electromagnetic, gravimetric and other geophysical surveys; prospecting for mineralized outcrops; detailed geological mapping.	To confirm the presence of the reconnaissance anomalies before drilling or trenching.
3	Exploratory Drilling and Trenching	Sampling of shallow anomalies by blasting trenches to expose fresh rock; sampling of overburden by shallow drilling; diamond drilling of bedrock to depths of up to several thousand feet; chemical analysis of core samples.	To determine if the mineralized body is of sufficient size and quality to justify the high costs of future development work.
4	Systematic Predevelopment Work and Preliminary Economic Evaluation	Closely spaced diamond drilling; ore-reserve calculations; preliminary mining and metallurgical studies; start environmental studies; preliminary economic evaluation including market studies.	To establish ore reserves, production rate, profitability.
5	Final Feasibility Study	Engineering design of mine, mill and ancillary services; environmental impact assessment; final economic evaluation — financing.	To determine if mine should be brought into production.
6	Mine Development	Establish operating organization; development of underground or open-pit mine; construction of treatment plant and ancillary services environmental impact assessment; final economic evaluation — financing.	To prepare the mine for production. This stage normally involves contractors and consultants each having expertise in specific areas.
7	Mining & Milling Operation	Mining and milling of the ore and marketing of the product.	Following a tune-up period the new mine normally reaches its rated capacity within the first year. In a joint-venture project each partner is responsible for marketing its share of the product from the operation.

TABLE II
EXPLORATION — YUKON

LOCATION⁽¹⁾	COMPANY⁽²⁾	PROPERTY/ AREA⁽³⁾	MINERAL⁽⁴⁾ IZATION	EXPLORATION STAGES⁽⁵⁾
1	Pan Ocean	JASON	Pb-Zn	3**
2	Archer, Cathro	ABBEY	Pb-Zn	3
3	Placer	Howards Pass	Pb-Zn	4
4	Cominco	FIN	Pb-Zn	3
5	Cominco	BARB	Pb-Zn	3
6	Cyprus Anvil	KLUNK	Pb-Zn	2
7	Cyprus Anvil	DWONK	Pb-Zn	3
8	Hudson Bay	BIG	Pb-Zn	2
9	Cyprus Anvil	BNOB, EROS	Pb-Zn	3
10	Cyprus Anvil	ANISE	Pb-Zn	3
11	Noranda	Canol Mines	Pb-Zn	3
11	Rio Alto	Stormy Mtn.	W, Mo	3
12	DC Syndicate	BAR	Pb-Zn-Ag	3
13	Fishbrook Joint Venture	AM, TAY	Pb-Zn	3*
13	Union Carbide	FELIX	W	2
14	Getty/US Steel	Clear L.	Pb-Zn	2
15	Cominco	TUM	Pb-Zn	2
16	Cominco	HOLLY	Pb-Zn	3
17	Prism	VAL, VERA	Ag-Pb-Zn	4**
18	Canadian Superior	CRAIG, SIAN	Ag-Pb-Zn	3*
19	Island Mining	WAYNE, FIRST CHANCE	Ag-Pb-Zn	
19	United Keno	LEO-KPO	Ag-Pb-Zn	3*
19	Skidagate Exploration	RAM, TUNDRA	Ag-Pb-Zn	
20	Archer, Cathro	PLATA	Ag-Pb-Zn	2
21	Tintina	TINTINA	Ag-Pb-Zn	3
22	Cima	Mt. Hundere	Ag-Pb-Zn	5
23	Rio Alto	Rusty Springs	Ag-Pb-Zn	3
24	Archer, Cathro	IVO	W	2
25	Archer, Cathro	BOOT	W	3*
26	Amax	CARIBOU	Mo	2
27	Amax/Pan Ocean/Serem	FIDLER	Mo, W, Sn	3
28	Western	HL	W	2
29	Dupont/Duval	DU, MC	Sn	3*
30	DC Syndicate	JC	Sn	3
31	Newmont	MINDY	W, Sn	2
32	Amoco/Tintina	Red Mountain	Mo	4**
33	Placer	CLOUD	Mo	3
34	Hudson Bay	CAB	W	3*
35	Dupont/Amax	T, W	W	3
36	Canada Tungsten	Potato Hills	W	4**
36	Canada Tungsten	Tin Dome	Sn	2
37	Cominco	NEL	Sn	2
38	CCH Resources	EPD, SNARK	Sn	3
39	Rio Tinto	IDA	W	2
40	Noranda	RAIL	W	2
41	Cominco	PLUTO	Mo	3
42	Placer	CLEA	W	3*
43	Mattagami	MARN	Cu	3
44	Anaconda	THOR	Cu	3
44	Anaconda	STYX	Cu	2
45	Cominco	BATTLE	Cu	2
46	Archer, Cathro	KOKUP	Cu	2
47	United Keno	STU	Cu	3**

LOCATION ⁽¹⁾	COMPANY ⁽²⁾	PROPERTY/ AREA ⁽³⁾	MINERAL ⁽⁴⁾ IZATION	EXPLORATION STAGES ⁽⁵⁾
48	Noranda	TAH	Cu	3
49	Whitehorse Copper	Whitehorse Copper Belt	Cu	3**
50	Eldorado	JOVE	U	3
51	Cordilleran/Getty	NOR	U	3
52	Cominco	KSD	Au	2
53	Canada Tungsten	Dublin Gulch	Au, W	3
54	Hudson Bay	Hayes Creek	Au	3
55	Archer, Cathro	LAFORMA	Au	2
56	Noranda	Freegold Mtn.	Au	3
56	Silver Tusk	TINTA HILL	Ag-Pb-Zn	4
57	United Keno	VENUS	Au	6
57	United Keno	Montana Mtn.	Au	2
58	Milchem	KAREN	Ba	3
59	Milchem	REIN	Ba	3
60	Baroid	CATHY	Ba	3
61	Yukon Barite/Milchem	TEA	Ba	4
62	Pan Ocean	Bonnet Plume	Coal	4
63	Archer, Cathro	TJOP	Asb	2
64	Noranda	Quartz L.	Pb-Zn-Ag	3*
65	Amax	LOGTUNG	W, Mo	4
66	Cyprus Anvil	GREGGIE	Pb-Zn	2
67	Union Carbide	TONSIL	W	3
68	Iona Silver	Ketza River	Ag-Pb-Zn	6
69	Welcome North	JULIA	Cu	2
70	Welcome North	AURORA	W	2

FOOTNOTES for Tables II & III

- (1) Table location is made with reference to corresponding numbers on Yukon and Northwest Territories Maps. Locations are approximate.
- (2) Abbreviated name of the Company is used: Expl. (Exploration), Ltd. (Limited).
- (3) Geographical areas are indicated by small print, whereas claims and groups are capitalized. Abbreviated words are: Peninsula (Pen).
- (4) Metal(s) of primary importance defined by chemical symbols: copper (Cu), gold (Au), lead (Pb), molybdenum (Mo), silver (Ag), barium (Ba), cobalt (Co), tin (Sn), tungsten (W), and uranium (U); other abbreviations include: placer (pl.), production (pr.).
- (5) Note drilling under Stage 3 in excess of 1400 meters (4600 feet) is denoted by an "*" and that in excess of 3000 meters (9840 feet) by "***".

TABLE III
EXPLORATION — NORTHWEST TERRITORIES

LOCATION⁽¹⁾	COMPANY⁽²⁾	PROPERTY/ AREA⁽³⁾	MINERAL⁽⁴⁾ IZATION	EXPLORATION STAGES⁽⁵⁾
1	Dejour Mines	Fury & Hecka St.	U	3
2	Noranda	Mackar Inlet	U	2
3	Aquitaine	Amer L.	U	3
3	Western Mines	Amer L.	U	3*
3	Union Oil	Amer L.	U	1
4	Seru Nucleaire	Deep Rose L.	U	1
5	Union Oil	Garry L.	U	1
5	Texasgulf	Garry L.	U	1
6	Comaplex/Mobil Oil	Sand L.	U	1
7	Canadian Nickel	Sand L.	U	1
7	Union Oil	Sand L.	U	1
7	Urangesellschaft	Sand L.	U	3
8	Essex Minerals	Schultz L.	U	3*
9	Texasgulf	Aberdeen L.	U	1
9	Hudson's Bay Oil & Gas	Aberdeen L.	U	1
10	Hudson's Bay Oil & Gas	Beverly L.	U	1
10	Western Mines	Beverly L.	U	3*
10	Seru Nucleaire	Beverly L.	U	1
11	Urangesellschaft	Marjorie L.	U	3
12	Cominco	Aberdeen L.	U	3
12	Marline Oil	Aberdeen L.	U	3
13	B.P. Minerals	Schultz L.	U	3*
14	Urangesellschaft	Lone Gull L.	U	4**
14	Urangesellschaft	Judge Sissons L.	U	3*
14	Comaplex	Judge Sissons L.	U	1
15	Pan Ocean	Bissett L.	U	3**
15	Noranda	Bissett L.	U	3
16	Comaplex	Forde L.	U	3
17	Houston Oil	Outlet Bay	U	1
18	Union Oil	Tulemalu L.	U	1
19	Pan Ocean	Nutarowit L.	U	2
20	Noranda	Yathkyed L.	U	3
20	Pan Ocean	Yathkyed L.	U	3
21	Esso Minerals	Ameto L.	U	1
22	PNC Explorations	Henik L.	U	2
23	PNC Explorations	Trebell L.	U	2
24	Noranda	Angikuni L.	U-Ag-Cu	3
25	Noranda	Carruthers L.	U	3
26	Pancontinental	Dubawnt L.	U	1
27	Urangesellschaft	Kamilukuak L.	U	1
27	Cominco	Kamilukuak L.	U	1
28	Cominco	Enekatcha L.	U	3
29	Esso Minerals	Mosquito L.	U	1
29	Texasgulf	Mosquito L.	U	1
30	Urangesellschaft	Mosquito L.	U	1
31	Canadian Nickel		U	1
32	Gulf Minerals	Eyeberry L.	U	1
33	Union Oil		U	1
33	Hudson's Bay Oil & Gas	LEM	U	3
34	Uranerz	Heron L.	U	3
35	PNC Explorations	Thekulthili L.	U	2
36	SMD Mining	THEK	U	3
37	Scurry-Rainbow	Snowdrift	U	2

LOCATION ⁽¹⁾	COMPANY ⁽²⁾	PROPERTY/ AREA ⁽³⁾	MINERAL ⁽⁴⁾ IZATION	EXPLORATION STAGES ⁽⁵⁾
38	Scurry-Rainbow	Union Island	U	3
39	Urangesellschaft	Bathurst Inlet	U	1
40	Eldorado	EMAZ	U	3
41	Chevron Standard	WOP	U	3
42	Meyer Consultants	JANET	U	3
43	AGIP	Leith Pen.	U	2
44	B.P. Minerals	PAT	U	3
45	B.P. Minerals/ Canadian Nickel	B	U	3
46	Uranerz	Melville L.	U	1
47	B.P. Minerals/ Canadian Nickel	IS	U	3
48	Canadian Nickel	BIGGEST	U	3
49	Cominco	PEC	U	3
49	Alberta Energy/ B.P. Minerals	Dismal L.	U	1
50	Cominco	POLARIS	Pb-Zn	6
51	Cominco	Cornwallis I.	Pb-Zn	1
52	Cominco	Allan R.	Pb-Zn	3
53	Nanisivik	Strathcona Sound	Pb-Zn	4
54	Esso Minerals	Ferguson L.	Cu-Ni	2
55	St. Joseph	Heninga L.	Zn-Cu	3*
56	Noranda	Keith I.	Pb	2
57	Noranda	MUSK	Pb-Zn	3
58	Cominco	BB	Pb-Zn	4
59	Noranda	RALPH	Pb-Zn	3
60	Noranda	BARB-DIX	Pb-Zn	3
60	Noranda	ARES-3	Pb-Zn	3
61	Texasgulf	TUK	Cu-Zn	3
62	Newmont	Strike L.	Cu	2
63	Noranda	NOD	Cu	3
64	Cominco	QUITO	Pb-Zn	3
65	Cominco	Windy Point	Pb-Zn	3
66	Gulf Minerals	TATH-Heart L.	Pb-Zn	3
67	Cominco	Hay West	Pb-Zn	3
68	Western	Hay River	Pb-Zn	4
68	Pine Point	Pine Point	Pb-Zn	4**
69	Noranda	RABBITKETTLE	Pb-Zn	2
69	Logan Mines	ROY	—	3
70	Rio Canex	VULCAN	Pb-Zn	3
70	Rio Canex	BIG RED	—	2
71	Canex Placer	Howards Pass	Pb-Zn	4
72	Noranda	Natla R.	Pb-Zn	2
72	Noranda	FIJI	Pb-Zn	2
73	Noranda	SPRINGLE	Pb-Zn	2
73	Rio Canex	MAJESTY	Pb-Zn	3**
74	Rio Canex	June L.	Pb-Zn	2
74	Canadian Nickel	PAZ	Pb-Zn	2
75	Shell Canada	Keele R.	Cu	2
76	Welcome North	Godlin L.	Pb-Zn	1
77	Welcome North	Canol Road	Pb-Zn	1
78	Canadian Nickel		Pb-Zn	3

LOCATION ⁽¹⁾	COMPANY ⁽²⁾	PROPERTY/ AREA ⁽³⁾	MINERAL- ⁽⁴⁾ IZATION	EXPLORATION STAGES ⁽⁵⁾
79	Cullaton Lake	Cullaton L.	Au	6**
80	Giant Yellowknife	ALLGOOD	Au	3
81	Goldfields	Wilberforce Falls	Au	2
82	Canuc Resources	ARCADIA	Au	3
83	Echo Bay	LUPIN	Au	6
84	Texasgulf	REN	Au	3
85	Paulson	Indin L.	Au	4
86	Giant Yellowknife	Salmita	Au	5
86	Noranda	Mackay L.	Pb-Zn	3
87	Giant Yellowknife	AP	Au	3
87	Hidden Lake	Hidden L.	Au	3
87	Cominco	Yellowknife Bay	Au	3
87	Cominco	Ptarmigan Mine	Au	3
88	Terra	Camsell R.	Ag	3
88	Echo Bay	Eldorado Mine	Ag	3
88	Echo Bay	Contact Lake Mine	Ag	3
88	Ech Bay	El Bonanza Mine	Ag	3
89	F. Blachut	Liard R.	Au	7
90	Cadillac	Prairie Creek	Ag-Pb-Zn	6
91	E. Dahlseide	MacMillan L.	Au	2
92	Union Carbide	IVO	W	2
93	Union Carbide	VC	W	2
93	Canada Tungsten	Baker	W	2
93	Union Carbide	LENED	W	4
93	Union Carbide	CAC	W	3
94	Amax	Mactung	W	6
95	Diapros	Blackwater R.	diamond	2
96		Beaulieu R.	lithium	2
96	Placer Development	THOR	tantalum	4
97	Borealis	Roche Bay	Fe	3



CA1
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Northern Affairs Program



Mines and Mineral Activities 1981

Northern Affairs Program



Cominco Ltd.'s Polaris Mine on Little Cornwallis Island. In the foreground are the mill-concentrator (left) and the concentrate storage building. In the background is the accommodation complex with its television satellite receiver and behind the complex is the airstrip. The mill-concentrator building is 450 feet (137 m) long and eight storeys high.



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Summary

The value of mineral production in the Yukon Territory and Northwest Territories in 1981 was \$764.3 million dollars, a decrease of 4.5 per cent in current dollars from the previous year. During 1981 the demand for most mineral commodities softened and prices for lead, copper, silver, and gold declined. Strikes at United Keno Hill Mine's silver operation and Canada Tungsten Corporation's tungsten mine reduced output of silver and tungsten. Exploration expenditures are estimated at \$40 million for the Yukon Territory and \$50 million for the Northwest Territories.

The outlook for 1982 is for increased lead and zinc production as Cominco's Polaris Mine in the Arctic Island region completes its first year of production. Gold production will also increase in 1982 as the Cullaton Lake gold mine completes its first full year of production and Echo Bay Mine's Lupin gold mine commences production during the first half of 1982. However, the short-term outlook for most potential major projects is dim because low metal prices, high interest rates, increased capital and operating costs and reduced corporate profitability have resulted in deferment of some mineral property developments. Mineral exploration expenditures are expected to decline sharply during 1982.

Mineral production in the Yukon Territory during 1981 was valued at \$307.9 million (excluding coal and natural gas), a decrease of 15 per cent from 1980. Production came from mine operations of Cyprus Anvil Mining Corporation (lead, zinc, silver); United Keno Hill Mines Limited (silver, lead, zinc); Whitehorse Copper Mines Limited (copper, gold) and Tantalus Butte Coal Company (coal) and about 197 placer gold mines. Placer gold production reached 3 104 kg in 1981 from 2 271 kg in 1980. Lead and zinc accounted for 50 per cent of mineral production value, followed by silver, 22.6 per cent, and gold, 20.7 per cent. Silver production at United Keno Hill Mines declined 29 per cent from 1980 because of a strike which extended from September 10, 1980 to May 28, 1981.

In 1981, Yukon accounted for 18.9 per cent of the lead, 8.7 per cent of the zinc, 14.3 per cent of the silver, 7.2 per cent of the gold, and 1.3 per cent of the copper produced in Canada. The Yukon accounted for 3.3 per cent of the value of Canadian metallic mineral production.

Mineral production in the Northwest Territories during 1981 was valued at \$456.4 million, an increase of 4.7 per cent from 1980. Production came from mine operations of Canada Tungsten Mining Corporation's Cantung Mine (tungsten); Cominco Ltd.'s Con Mine (gold, silver); Cullaton Lake Gold Mines Ltd. (gold); Echo Bay Mines Ltd. (silver, copper); Giant Yellowknife Mines Ltd. (gold, silver); Nanisivik Mines Ltd. (zinc, lead, silver); Noranda Mines Ltd.'s Camlaren Mine (gold); Pine Point Mines Ltd. (lead, zinc); and Terra Mining and Exploration Ltd. (silver, copper). Zinc production increased 28 per cent to 224 206 t in response to strong demand, while tungsten production dropped 38 per cent from the previous year to 2 490 t of WO_3 because of a strike at Canada Tungsten Mining Corp.'s Cantung Mine.

The Northwest Territories accounted for 100 per cent of tungsten, 23.8 per cent of lead, 22.5 per cent of zinc, 7.4 per cent of gold and 3.1 per cent of silver produced in Canada. The Northwest Territories also accounted for 4.9 per cent of Canadian metallic mineral production value.

Mining in the Northwest Territories continued to expand in 1981 with five new mines being developed for initial production in late 1981 and 1982. These include Cominco Ltd.'s Polaris lead-zinc mine and Ptarmigan gold mine, Echo Bay Mine Ltd.'s Lupin gold mine, Cullaton Lake Gold Mines Ltd.'s gold mine, and Cadillac Explorations Ltd.'s Prairie Creek silver-lead-zinc mine. These developments will augment lead, zinc and gold production substantially and more than offset the closing of the Camlaren gold mine in 1981 and Echo Bay's Port Radium silver operation in 1982. Terra Mining and Exploration Ltd.'s Silver Bear silver mine ceased operations in February 1981 but operations may be resumed in 1982. The Salmita gold mine of Giant Yellowknife Mines Ltd. may also be brought into production following the current underground exploration and development program.

Introduction

This report covers mines and mineral activities North of 60° for the year 1981. All aspects of these operations in the Yukon and the Northwest Territories are administered by Northern Non-renewable Resources Directorate, Department of Indian Affairs and Northern Development.

Sections on mineral exploration in the Yukon were based on papers by D. Tempelman-Kluit, J.G. Abbott, R.L. Debicki and J.A. Morin and in the Northwest Territories by W.A. Padgham, W.A. Gibbins, P.J. Laporte, C.C. Lord, and J.B. Seaton. D.D. Brown and T.W. Caine compiled and edited this report.

As of March 8, 1982, the Minister and departmental officers responsible for the administration of mines and mineral resources in the Northwest Territories and the Yukon were:

Minister:	Hon. John C. Munro
Deputy Minister:	Paul M. Tellier
Assistant Deputy Minister: (Northern Affairs) Ottawa	G.N. Faulkner
Director, Northern Non-renewable Resources <i>Directorate:</i> Chief, Mining Division:	Dr. H.W. Woodward J.M. Hodgkinson
Head, Mining Resources Section:	Dr. D.D. Brown
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Mining Division

Responsibilities

The Mining Division administers mining and mineral rights (excluding oil and gas), develops policies, and initiates and assists in drafting appropriate legislation relating to the administration and disposition of mineral rights in the Yukon Territory and Northwest Territories. The Mining Division advises various government agencies on current and proposed exploration and mining developments, and maintains a mineral resource inventory. The Mining Division in Ottawa is comprised of two sections – Mining Resources and Mining Lands.

In the North, mine and mineral responsibilities are administered by two Regional Directors who are responsible for the Northern Affairs Program in the Yukon and Northwest Territories respectively. Three separate sections are located in Whitehorse, Y.T. and two in Yellowknife, N.W.T. These are a Geological Services Section and a Mining Lands Section at both cities. A Mine Inspection Section is located at Whitehorse, Y.T., whereas similar service at Yellowknife, N.W.T., is provided by the Government of the Northwest Territories.

Mining Lands

The Mining Lands Section develops policies and initiates and assists in drafting appropriate legislation relating to the administration and disposition of mineral rights in the Yukon and Northwest Territories.

For administrative purposes the Territories have been divided into seven mining districts. A mining recording staff is responsible for the disposition of mineral rights within each district in accordance with applicable legislation. There is a Supervising Mining Recorder in each Territory whose principal function is to ensure that uniform practices are observed in the administration of the various mining acts and regulations.

Mining Resources

The Mining Resources Section maintains a microfilm library on all published geoscientific reports and unpublished assessment reports on mineral properties in the Yukon and Northwest Territories. This office's prime concern is assessment and definition of mineral potential for specific commodities and of areas in the territories relating to proposals concerning land use, parks, land claims, transportation routes, power developments, etc. This Section and Mining Division as a whole inform and advise the Minister on current and proposed mine and exploration developments in the North. Monthly Mines and Mineral Statistics and annual Mines and Minerals Activities reports are produced by the Mining Resources Section for use by the mining industry, public and government.

Geological Services Sections provide a geological service to the mineral industry in the North. Offices are maintained at Whitehorse and Yellowknife. Two core libraries, the H.S. Bostock Library at Whitehorse and the C.S. Lord Library at Yellowknife preserve diamond drill core.

Each has laboratory facilities for core splitting, diamond-saw cutting, thin section preparation and core storage. Regional and district geologists conduct mineral property examinations, collect rocks and mineral specimens and advise the mineral industry, government departments and research scientists on geological and exploration matters. Department geologists assist prospectors in identifying rock and mineral specimens, by conducting prospector training courses and preparing geological compilation maps on mineralized areas.

Mine Inspection

The Mines Inspection Section gives advice on the Mining Safety Ordinance and Mine Safety Regulations of the Yukon Territory as well as the Blasting Ordinance and Regulations of the Yukon Territory. It also prepares new safety legislation when required. A regional mining engineer is stationed at Whitehorse. This senior mining engineer has a staff consisting of a district engineer, an electrical-mechanical engineer, an environmental engineer, a mine rescue superintendent, a claim inspector and a clerk. The Section is responsible for the following: inspection of mines, quarries and blasting operations to ensure compliance with safety legislation; inspection of mineral claims to ensure compliance with safety legislation; inspection of mineral claims to ensure compliance with the Yukon Quartz Mining Act; ensuring that sufficient mine personnel are trained in mine rescue, recovery operations and first aid; conducting ventilation and dust surveys; monitoring radioactive contamination, and carrying out environmental studies at underground and surface mining properties.

Surface complex of buildings at Whitehorse Copper Mines Ltd. a few kilometers west of Whitehorse, Yukon.



Yukon Territory

Mining Production and Development

Mineral production in the Yukon Territory during 1981 was valued at \$307.9 million (excluding coal and natural gas), compared to \$364 million during 1980. Some 86 per cent of gold production came from placer mining operations, and four mine establishments accounted for production of base metals, precious metals and coal. They are Cyprus Anvil Mining Corp. (zinc, lead, silver); United Keno Hill Mines Ltd. (silver, zinc, lead); Whitehorse Copper Mines Ltd. (copper, gold); and the Tantalus Butte mine (coal).

Placer mining production continued to increase and amounted to at least 99 799 fine oz (3 104 kg) in 1981 valued at \$55 million compared to 73 026 fine oz (2 271 kg) in 1980 valued at \$42.9 million. Mining operations were carried out in the Sixty Mile, Klondike, Clear Creek, Minto Lake, Haggart Creek and Burwash regions as well as other widely distributed areas.

The Yukon accounted for 18.9 per cent of the lead, 8.7 per cent of the zinc, 14.3 per cent of the silver, 7.2 per cent of the gold and 1.3 per cent of the copper produced in Canada. In 1981, the Yukon accounted for 3.3 per cent of the value of Canadian metallic mineral production.

Some 993 Yukon employees, representing 8.6 per cent of the work force, were permanently employed by the producing mines and additional persons were employed in placer mining.

Development work continued on a number of properties. Cyprus Anvil Mining Corporation proceeded on its long-term \$240 million program which will include the development of two new open-pit mines on the Grum and Vangorda ore deposits by the late 1980s and possibly the underground DY deposit. As part of the overall program, modifications to the Faro mill were carried out during the year to enable satisfactory recoveries and concentrate grades when the Grum and Vangorda ores are processed. A major expansion to the tailings facilities was completed and additional power generating capacity was installed.

United Keno Hill Mines Ltd. developed its Venus gold-silver-lead mine (77) at a cost of \$9.2 million for a return to production. The project was suspended in October 1981 because of lower than anticipated silver prices and higher than expected capital and operating costs, which had seriously jeopardized the economic viability of the project. The mine is 88 km south of Whitehorse and the 91 t per day mill is 10 km south of the mine, across the border in British Columbia. The mine and mill will be on standby until precious metal prices improve.

Hudson Bay Mining and Smelting continued its \$10 million underground exploration and development program on its Tom lead-zinc-silver property (15), near MacMillan Pass, on the Yukon-Northwest Territories border. Work on the decline advanced 872 m to a depth of 125 m. Eight underground diamond drill holes were completed for a total of 690 m. The project will be terminated in April 1982 because of prevailing low metal prices.

Also in the MacMillan Pass area, straddling the Yukon-Northwest Territories border, is the Mactung tungsten deposit of Amax Canada Limited (15). At year-end 1981, Amax announced that production at the Mactung property will not be scheduled before 1984. The Mactung deposit is the largest tungsten deposit in the western world. Together with the Cantung Mine of Canada Tungsten Mining Corporation (a on Map 2), annual production from this region could reach 6.35 million kg (14 million lbs.) of tungsten (W) contained in concentrates by the mid-1980s.

At Howard's Pass, near the Yukon-Northwest Territories border, Placer Development Limited and Essex Minerals continued underground exploration and development in the shale-hosted stratiform XY lead-zinc deposit (16). A total of 457 m of drifts and 256 m of cross-cuts were advanced, and underground drilling tested the mineralization. More work is planned for 1982.

Although molybdenum prices were at distress levels during 1981, Amoco Canada Petroleum Ltd. and Tintina Mines Ltd. reported encouraging drill hole intersections from the Red Mountain molybdenum deposit (50), 80 km east of Whitehorse. Reserves have been calculated at 71.6 million t averaging 0.223 per cent MoS_2 at a cut-off grade of 0.15 per cent MoS_2 .

Cyprus Anvil Mining Corporation

Cyprus Anvil Mining Corporation continued to mine the Faro deposit (b). The Faro mill processed 2 751 790 t of ore to produce 201 200 t of zinc concentrate (49.5 per cent zinc) and 111 628 t of lead concentrate (55.1 per cent lead). The company completed the first phase of its long-term \$240 million expansion program which includes the development of two new open pit mines on the Grum and Vangorda ore deposits during the 1980s. During 1981, modifications to the Faro mill were completed which will enable satisfactory recoveries and grade of concentrate to be achieved when the Grum and Vangorda ores are processed. Indications are that such milling will commence by 1990. Feasibility studies are underway to determine the development plan for the Grum and Vangorda deposits.

Type:	Open-pit
Location:	209 km northwest of Whitehorse
Product:	Zinc, lead, silver, in concentrate
Mill Rate:	7 410 t per day
Tonnes Milled:	2 751 790
Reserves:	30.9 million t in Faro deposit (Dec. 31, 1981)
Reserve Grade:	3% lead, 4.6% zinc, 38.7 g silver per t
Employees:	490



United Keno Hill Mines Limited

United Keno Hill Mines Limited (d) continued to produce silver-bearing lead and zinc concentrate from six underground mines and two open-pit mines and stockpiled ore, all in the Elsa area. In 1981 the company's Elsa mill processed 60 700 t of ore to produce 36 569 kg (1 175 732 oz) of silver contained in 3 536 t of lead concentrate and precipitate. Production in 1981 was 15 187 kg (488 268 oz) less than in 1980. Production during 1980 and 1981 declined from 1979 when silver production amounted to 72 178 kg (2 320 522 oz), because the mine operation was struck from September 10, 1980 to May 28, 1981. The company will suspend operations at lower grade open-pit mines in 1982 and increase production at higher grade mines, such as the Husky and Ruby mines, because of low silver prices and high operation costs.

Type:	Underground and open-pit
Location:	50 km northeast of Mayo
Product:	Silver, lead, zinc
Mill Rate:	356 t per day
Tonnes Milled:	60 700
Ore Reserves:	242 132 t (Dec. 31, 1981)
Reserve Grade:	925 g silver per t, 4.1% lead, 0.3% zinc
Employees:	280

Whitehorse Copper Mines Limited

Whitehorse Copper Mines Limited (a) continued to mine from its underground mine near Whitehorse. The company milled 726 100 t of ore to produce copper concentrate containing 9 068 t of copper. Silver contained in concentrate amounted to 6 045 kg. Gold contained in concentrate amounted to 489 kg. The mine is expected to close in the fourth quarter of 1982 because of ore reserve depletion.

Type:	Underground
Location:	11 km south of Whitehorse
Product:	Copper, gold, silver
Mill Rate:	2 014 t per day
Tonnes Milled:	726 100
Ore Reserves:	1 202 040 t (Dec. 31, 1981)
Reserve Grade:	1.35% copper
Employees:	205

Tantalus Butte Coal Company

Tantalus Butte Coal Company (c) mined 20 860 t of coal from its open-pit mine near Carmacks during three months in 1981. Coal from the mine is delivered to the Cyprus Anvil concentrator near Faro for use in drying lead and zinc concentrates.

Type:	Open-pit
Location:	Carmacks
Product:	Sub-bituminous coal
Tonnes Produced:	20 860
Reserves:	27 000 t (Dec. 31, 1981)
Employees:	18 (seasonal basis)

Placer Mining

Placer activity continued at a high level in 1981 and drill testing and bulk sampling were conducted in several areas to define placer gold resources. Mining operations were carried out on Sixty Mile, Klondike, Clear Creek, Minto Lake, Haggart Creek and Burwash Creek (96), Livingstone Creek (97) and other areas. Canada Tungsten Mining Corporation Ltd. operated its 152.8 m³ (200 cubic yard) per day gold-tungsten placer plant on the Dublin Gulch property for the first full year in 1981. Queenstake Resources Ltd. operated its 1 528 m³ (2 000 cubic yard a day bucket line dredge on Clear Creek (95) near Mayo. Other companies include Copperfields Mining Corporation on Sulphur Creek (94) and Sixty Mile River (92) near Dawson; Miben Mining in the Dawson area; Crescent Mines Limited and associated Sundance Gold Limited with placer operations on Clear Creek, east of Dawson (95), and Cogasa Mining Corporation on the Sixty Mile River (92). Among the larger private companies were Territorial Gold Placers Limited with camps in the Klondike area, the Arctic Rim Operators with operations on three properties in the Dawson area, and Lorne Ross in the Klondike area. While most operations use the conventional sluice box mining method, there were a number of innovative devices used to recover gold. Two underground mines were started on Hunker and Miller Creeks in the Klondike (93) area to recover gold from the Tertiary White Channel gravel deposits.

Mineral Exploration

Mineral claims staked and recorded in the Yukon Territory during 1981 with comparative figures for 1980 are:

Districts	Claims Recorded	
	1981	1980
Whitehorse	3586	3281
Dawson	1068	2091
Mayo	3208	2253
Watson Lake	3430	3545
Total	11292	11170

In addition, 7 160 placer claims and 597 placer leases, largely in traditional mining areas were registered. The decrease in gold price during late 1980 and 1981 curbed the rush to acquire leases, but the number of claims staked increased as existing leases were converted to claims. The total length of claims and leases held increased to 6 210 km on Sept. 30, 1981 compared to 5 830 km in 1980 and 3 500 km in 1979. Bulk sampling programs were carried out on a number of properties. Water permits were issued for 350 placer mining operations.

Exploration activity in the Yukon continued at a strong pace in 1981; however, the outlook at year end (1981) was for reduced exploration activities in 1982 because of economic recession and low metal prices. Advanced stages of exploration and development on properties with mineral deposits accounted for much of the \$40 million estimated for Yukon mineral exploration in 1981. Exploration projects continued to reflect interest in zinc-lead-silver, tungsten, molybdenum and gold deposits.

A summary of exploration activities is given in Table II, and locations of these exploration activities are shown by numbers in Map 1.

Lead-Zinc-Silver

Lead-zinc-silver targets were the object of drilling in the Anvil district, MacMillan Pass area and Clear Lake area.

The intriguing shale-hosted massive sulphide-barite deposit at Clear Lake (7), across the Tintina Trench, was investigated by the MacMillan Joint Venture of Getty Mines Ltd. and Essex Minerals Co. Some drill intersections of the stratiform pyrite, pyrrhotite, galena, sphalerite and barite mineralization are over 100 m long. Some 50 km to the east of Clear Lake, Welcome North Mines Ltd. and Esperanza Explorations Ltd. discovered lead-zinc mineralization in Devonian-Mississippian rocks and staked the LADY DI claims (27). Anaconda tested its STYX claim groups (2), 35 km north of Dawson City, with 350 m of drilling. The company also drilled 1 000 m in a lead-zinc-silver skarn on the ACE property, in the Earn Group, east of Clear Lake (8), on Dromedary Mountain.

In the Faro-Ross River area, Cyprus Anvil Mining Corporation drilled 1 067 m on the TENAS, MEL, BAR properties (11), optioned from Welcome North Mines Ltd., in its continuing search for massive sulphides in Anvil-type strata. Getty Mines Ltd. conducted EM geophysical and geochemical surveys in the Anvil district over the EVA, ALICE and MABEL (10) claims and detailed gravity surveys on the RACHEL, MN and CIVI claims.

In the Pelly Banks area (17), Hudson Bay Exploration and Development drilled 685 m and conducted EM surveys to check out previously determined anomalies on ground optioned from the Pelly Bank Syndicate.

MAP-1
YUKON
MINERAL EXPLORATION AND
MINING - 1981

LEGEND



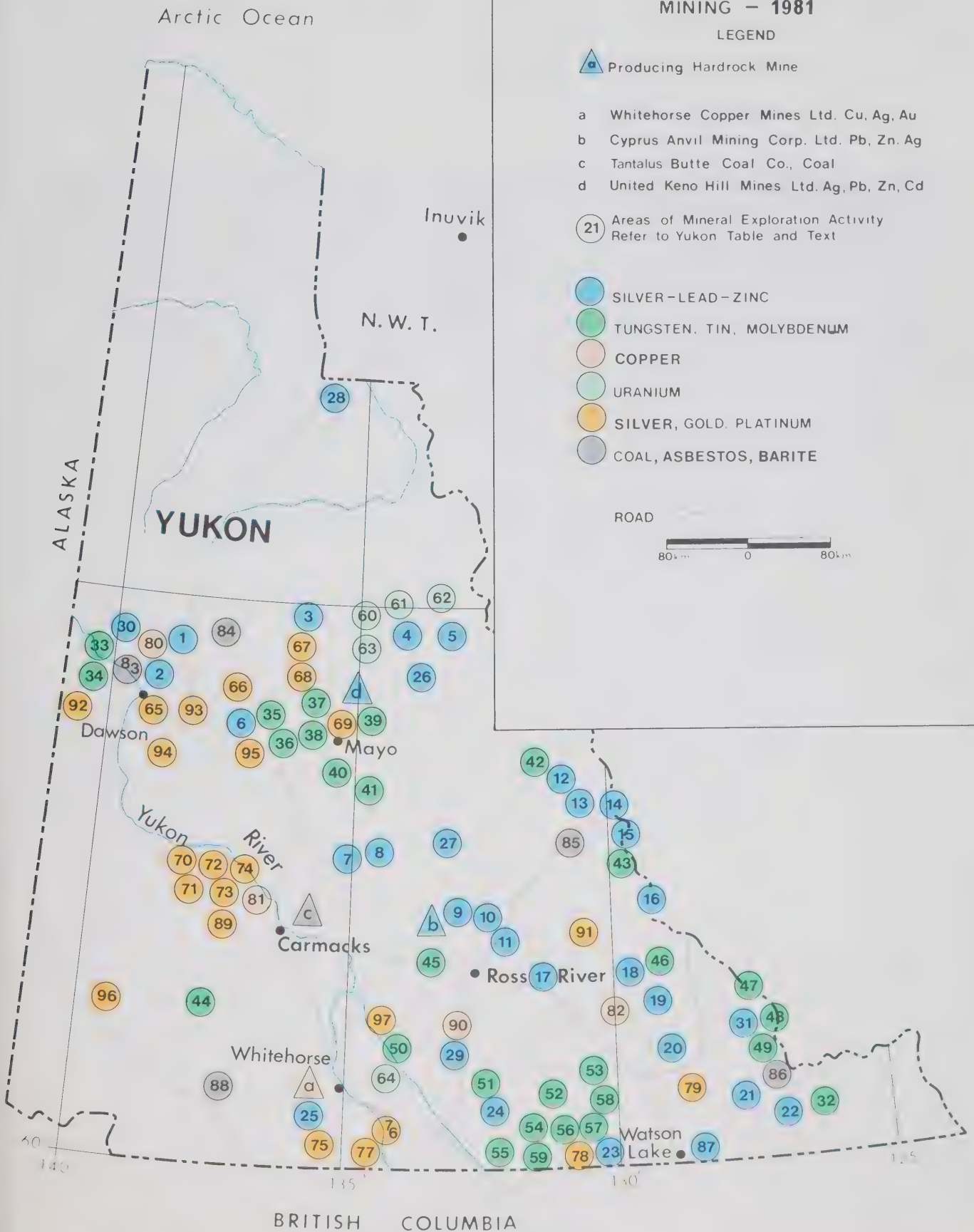
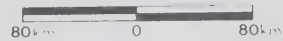
Producing Hardrock Mine

- a Whitehorse Copper Mines Ltd. Cu, Ag, Au
- b Cyprus Anvil Mining Corp. Ltd. Pb, Zn, Ag
- c Tantalus Butte Coal Co., Coal
- d United Keno Hill Mines Ltd. Ag, Pb, Zn, Cd

(21) Areas of Mineral Exploration Activity
Refer to Yukon Table and Text

- SILVER-LEAD-ZINC
- TUNGSTEN, TIN, MOLYBDENUM
- COPPER
- URANIUM
- SILVER, GOLD, PLATINUM
- COAL, ASBESTOS, BARITE

ROAD



The Elsa Mine of United Keno Hill Mines Ltd. at Elsa, Yukon.



In the MacMillan Pass area, Pan Ocean drilled 10 000 m on the Jason lead-zinc-silver property (15) and geological reserves were increased. The company used wedges to give several intersections, at each drill set-up on the steeply dipping mineralized zones. The property is owned by the Ogilvie Joint Venture comprised of Pan Ocean Oil Ltd., Mitsubishi Metal Corp., Brinco Ltd. and Ventures West Capital Limited. On the adjacent Tom lead-zinc-silver property (15) Hudson Bay Exploration and Development Company Ltd. advanced its decline by 580 m and drifts by 343 m, and drilled 690 m. This \$10 million underground exploration and development program will be terminated in April 1982 because of low metal prices. Future development will include 800 m of underground openings including a further 150 m advance of the decline. Also in the MacMillan Pass area, Canadian Nickel did soil geochemical sampling on the DUO claims (15) and Cominco continued working on its NIDD claim (14) group. AGIP Canada Ltd. mapped its NEVE claims (12).

In the Howard's Pass area, Placer Development Limited and Essex Minerals Co. continued underground exploration and development work in the shale-hosted stratiform XY lead-zinc deposit (16). A total of 457 m of drifting and 256 m of cross-cuts were advanced, while 960 m of drilling tested the continuity of mineralization. More drilling is planned for 1982.

Southeastern Yukon witnessed a considerable search for lead-zinc. Cyprus Anvil, on its large holdings in the Frances Lake area (20), conducted the ANMAC regional project over a wide area using conventional geological mapping, geophysics and geochemistry.

In the southeastern Yukon, Noranda Mines Limited and Asarco Inc. conducted electromagnetic (EM) and gravity surveys and drilled 610 m on the Quartz Lake lead-zinc-silver deposit (21). No new reserves were indicated. Some 35 km to the southeast of the Quartz Lake property in the Coal River area, Sulpetro Minerals Limited drill tested the southern extension of the MEL barite-lead-zinc deposit (22).

In addition, a zinc showing was discovered about 5 km east of the main MEL showing. On the east shore of Frances Lake (19), Cominco Ltd. attempted to find an extension of the known zone of lead-zinc-silver mineralization on the BARB claims optioned from Sovereign Metals. Cominco Ltd. also worked on its FIN claims (18), 32 km to the northwest. Archer, Cathro and Associates worked on the BAR claims (24) for Chevron where a barite horizon with associated quartz, pyrite and galena occurs between chert pebble conglomerate and chert of probable Devonian-Mississippian age. Logan Mines optioned the ROMAN claims (87), 10 km southeast of Watson Lake and geological mapping, geochemical and geophysical surveys were conducted. On the west side of Coal River (31), Archer, Cathro worked on the FYIQ claims where a lead-zinc-silver skarn has been found.

Working on shales of Helikian age, 164 km northeast of Mayo, Rio Tinto drilled 300 m on the CORD (4) claims. The holes encountered low grade lead-zinc intersections (less than 2 per cent combined).

North of Mayo in the Bonnet Plume area, Amax of Canada Ltd. tested the DOC claims on Mt. Profeit (5), where several pods of massive lead-zinc-silver mineralization in Hadrynian dolomite occur. Five holes totalling 686 m did not encounter significant intersections.

Amax Ltd. searched for shale hosted massive sulphide deposits in the Hess River area on the FAN claims (13) and near Mt. Cook, west of Ross River on the GREW claims (45).

Mattagami Lake Exploration conducted work northeast of Dawson on the RIKI claims and TAK claims (1). The company also investigated the FIONA claims, 82 km northwest of Mayo (6). In the south Richardson Mountains, Mattagami Lake Exploration worked on the TOUCHE claims (28) which cover zinc mineralization associated with a fault.

Northwest of Mayo, Mattagami worked on its DALE and MELA claims (3) where only minor lead-copper occurrences were found in Helikian phyllite.

A lead-zinc-silver skarn on the RAM claims (39) near Primrose Lake was evaluated by Canadian Nickel Company.

Amax of Canada Ltd. through its operator Cordilleran Engineering conducted geochemical and EM surveys and trenching and drilled 854 m on the MIDWAY zinc-lead-silver property (23), 96 km west of Watson Lake. The property [REDACTED], optioned from Regional Resources Ltd., is mainly in British Columbia, but extends into the Yukon. Drilling showed that the true width of the Discovery zone is 4.6 to 11 m with grades up to 9.3 per cent lead and zinc combined and 87.9 g per t silver. In 1981 over \$1 million was expended on the property. Geological mapping, geochemical sampling and airborne electromagnetic survey work were conducted on the Yukon side of the property. In the same area, Amax and ProCan Explorations worked on the WOLF claims (23) in search of shale-hosted massive sulphides.

In the Quiet Lake area, Consolidated Occidental Petroleum Ltd. staked the MOX (29) claims to cover a copper-lead-zinc-silver skarn target on the margin of the Quiet Lake Batholith. Mineralization consists of chalcopyrite, galena and sphalerite in narrow discontinuous beds of calc-silicate-bearing marble.

Cominco Ltd. followed up work on its MICKEY claims (30), 59 km west-northwest of Dawson, and one diamond drill hole encountered lead-zinc mineralization with narrow sections grading up to 2 per cent lead-zinc combined.

Tungsten

Tungsten was a leading exploration commodity in 1981. In the MacMillan Pass area, Amax of Canada Limited continued its feasibility studies on the Mactung tungsten (15) property. The company announced proven and probable reserves of 13.6 million t averaging 1.02 per cent WO_3 out of total geological reserves/resources of 57 million t grading 0.95 per cent WO_3 . The ore deposit straddles the Yukon-Northwest Territories border. The company is looking at a possible mine operation of 907 t of ore a day with initial production in 1984 or thereafter. A feasibility study on the \$150 million project will be completed by the end of 1982 and a decision on production will be made subsequently.

Amax was also proceeding with a pre-feasibility study of Logtung Resources Ltd.'s Logjam Creek tungsten-molybdenum property (55), 120 km east of Teslin.

North of Mayo, in the Dublin Gulch area, Canada Tungsten Mining Corporation Ltd. continued evaluating its scheelite-bearing skarn deposit at Ray Gulch (37). A total of 11 280 m of diamond drilling in 61 fill-in definition holes substantiated the geological reserve of 7.3 million t grading 0.5 per cent WO_3 , including 3.63 million t of 0.96 per cent WO_3 . Noranda Mines Ltd. continued work on its RAIL claims (33), 35 km northwest of Dawson. Coarse grained calc-silicate-sulphide-scheelite contact skarn occurs as intermittent float and felsenmeer over a 61 m length along the northern contact of a quartz monzonite stock. Diamond drilling in 1980 showed the calcsilicatesulphidescheelite skarn to be up to 120 m thick. South of the Mayo area, Dupont drilled 396 m on the TWO BUTTES property (40). The holes intersected 10 to 15 m of skarn with assay values ranging from a trace to 0.1 per cent WO_3 .

Southeast of Mayo, Union Carbide Canada Ltd. explored its Kalzas property, near Kalzas Twins, where mineralization consists of several one to 60 cm thick quartz-wolframite veins. The property is covered by the WOLF, PAT, DAVID and BLACKY claim groups (41).

Island Mining and Explorations Co. Ltd. conducted a diamond drilling program on the WAYNE claims (39) near Keno City, where high-grade tungsten values were intersected in a skarn.

South of Faro, Hudson Bay Exploration and Development continued work on the CAB property (45) optioned from Risby Tungsten Mines. A nine hole diamond drilling program of 2 200 m defined the extension of the No. 2 zone down dip. The zone consists of two scheelite-bearing skarn horizons lying between sedimentary rocks and a quartz monzonite stock. The lower and most persistent of the two horizons extends for a strike length of 660 m and vertical depth below outcrop of 350 m.

Northwest of Howard's Pass, the CLEA tungsten prospect (43) was the object of five diamond drill holes totalling 1 622 m by Placer Development.

In the south eastern Yukon, in the Rancheria area, Serem Ltd. worked several skarn properties including the URSUS (58), TEAM (53), CABIN (58), STONEAX, SOURCE (52) and LOOTZ (32) claim groups. Also in the Rancheria area, a joint venture of Amax, Pan Ocean and Serem drilled one hole totalling 549 m on the FIDDLER (57) scheelite-bearing skarn and associated base metal quartz veins.

Tungsten-bearing skarns were also investigated by Noranda Mines Ltd. on the ROSE claims (47) and Canadian Occidental Petroleum on the GOAT claims (56), and HATCH and THATCH claims (44). Archer, Cathro worked on five contact skarn properties in the southeastern corner of Yukon which include the SPORK (49), CREAM (47), VNER, SNEET and IVO (48) claims.

Gold-Silver

Lode gold deposits were sought by a number of companies, particularly in the western Yukon. On Freegold Mountain, Archer, Cathro and Associates worked the Rambler Hill rhyolite porphyry plug (69) for Arctic Red Resources Corp. The plug carries low values of gold and silver. Ten diamond drill holes were completed for a total of 1 193 m. Arctic Red Resources Corp. also rehabilitated the adit on the nearby Laforma vein (73) and the company plans to conduct underground exploration and development work in 1982. Noranda carried out minor trenching on the DART claims (73) which covers the old Emmons Hill gold-antimony quartz vein on Freegold Mountain. Northeast of Freegold Mountain, Silver Tusk Mines Ltd. continued underground exploration and development on the Tinta Hill silver-gold-zinc-lead property (74). A total of 973 m of drifts and cross cuts from two portals were developed exposing gold-silver-copper-lead-zinc bearing veins. Drill indicated geological reserves on one vein amount to 771 120 t. Archer, Cathro and Associates staked NITRO claims on the old Klazan property (72), southwest of Freegold Mountain and continued property work on the LILYPAD, NAT and KNUTE (71) claim group on Prospector Mountain where several high grade argentiferous veins occur in Mt. Nansen Group volcanics. BRX Mining and Petroleum Corp. trenched gold-silver-lead-bearing veins on the TAWA (89) claims west of Mt. Nansen. On Jubilee Mountain (76), southeast of Whitehorse, several diamond drill holes tested a previously known gold showing. Southwest of Whitehorse, in the Wheaton River area, AGIP Canada Ltd. worked the KUKU claims (75). In the Dawson area, Archer, Cathro conducted soil geochemical programs on the Lone Star property (65) for Dawson Eldorado Exploration. Archer, Cathro also sampled the TEFATJV claims (65). Northwest of Carmacks, Hudson Bay Exploration and Development drilled six holes totalling 812 m to test EM anomalies on the Sonora Gulch option (70).

In the Aussie Creek area, 90 km east of Dawson (66), Rio Tinto sampled a gold-bearing zone on the IDA claims. The company also did work on a gold target in the STROKER claims (68), 85 km north of Mayo.

Silver (Lead, Zinc)

Prism Resources Ltd. and other joint-venture companies continued underground exploration and drilling of the silver-lead-zinc VERA (Rusty Mountain) property (26), 112 km northeast of Mayo, in the Kathleen Lakes area. During 1981, extensive diamond drilling and underground development work provided a data base from which indicated reserves are estimated at 864 000 t grading to 684.3 g per t silver and 3 to 4 per cent combined lead and zinc. Existing reserves come from the Vera East, Vera West and South Zone 5 and the Siltstone showing. Expenditures in 1981 amount to \$2.5 million.

North of Mayo, 110 km, Archer, Cathro and Associates staked the BLENDE claims (67), over a silver-lead-zinc vein in Proterozoic dolomite. The vein is over 900 m long and gave high-grade silver assays. United Keno Hill Mines Ltd. completed 10 471 m of overburden drilling and 1 946 m of diamond drilling in three areas on Keno Hill (d) and seven areas on Galena Hill, both near Keno City. In addition, 923 m of underground diamond drilling was carried out at the Keno, No Cash and Ruby mines. Surface stripping conducted out on the Birmingham vein, Miller vein and Calumet 4 and 11 veins. Canada Tungsten Mining Corp. investigated several properties in the Keno Hill area, including the Gold Hill claim and the Mount Keno Mines property (69) where significant vein structures were outlined. On the ZAP claims, the company drilled holes totalling 366 m on a vein fault breccia (69). In total, Canada Tungsten drilled 1 828 m of over-burden drilling and 1 371 m of diamond drilling in the Keno Hill area.

In the southeastern Yukon, Canadian Occidental Petroleum Ltd. worked on the LICK claims (78) where lead-zinc mineralization has been found in shear zones in granitic rocks. North of Watson Lake, Cima Resources Ltd. drilled the Mt. Hundere property (79) to confirm the eastern continuation of known zinc-lead-silver mineralization.

Turner Energy and Resources completed soil geochemical sampling and an electromagnetic survey of its property on Rambler Hill (69) adjacent to the United Keno Hill Mines Ltd. mine.

Copper

The search for copper in 1981 was minor. United Keno Hill Mines Ltd. continued work on several properties west of Carmacks including the STU (81), PHIL, MOON, DEATH, DAD, HI and NOON claims where an airborne electromagnetic, and ground geochemical surveys were conducted. Esso Minerals investigated a massive pyritic sulphide body on the JULIA claims (82), 140 km southeast of Ross River. Mattagami Lake Exploration continued work on the MARN skarn (80) 55 km north-northeast of Dawson where copper-silver-gold values have been encountered in a diopside amphibolite skarn. Minor geological mapping and 1 000 m of diamond drilling were conducted. More drilling will be conducted in 1982.

B.A. Copper Mines conducted preliminary geological mapping and soil geochemical sampling on the TOWER claims near Big Salmon Lake (90). Cima Resources mapped and drilled three holes on its PIKE claims, 80 km northeast of Ross River (91), where 300 000 t grading 0.5 per cent copper and 62.2 g per t silver is indicated.

Molybdenum

Amoco Canada Petroleum Co. Ltd. and Tintina Mines Limited continued drilling on the Red Mountain molybdenum property (50), 50 km east of Whitehorse. Six holes totalling 3 963 m were completed. Reserve calculations during 1981 indicate 22.4 million t grading 0.307 per cent MoS_2 at a cut-off grade of 0.25 per cent MoS_2 with larger tonnages at lower grades. On the PLUTO property, 54 km west-northwest of Dawson (34), Cominco and Getty Mines drilled eleven diamond drill holes, totalling 1 988 m which gave intersections of low grade molybdenum (0.02 to 0.05 per cent Mo) and erratic tungsten values.

A color photograph showing a geena-carbonate vein at the Elsa Mine of United Keno Hill Mines Ltd.



In the Frances Lake area, Union Carbide carried out geological mapping and rock geochemical sampling on the RENA claims (46). In the Arrowhead Lake area of the Hess Mountains, AGIP Canada Ltd worked on the ICE, FIRE and SUN claims (42) which cover a Cretaceous syenite intrusion containing extensive zones of thin veins bearing minor pyrrhotite, chalcopyrite, scheelite, molybdenite and arsenopyrite.

Tin

In the Rancheria area, southern Yukon, holes drilled on the SIN claims (54) by the DC Syndicate and on the JC property (59) by Cominco Ltd. were not successful in defining significant tin mineralization. Dupont of Canada Exploration Ltd. drilled 6 holes totalling about 1 200 m on the DU and SWIFT claims (54) in the Rancheria area, but only low tin values were encountered. North of Teslin, Newmont drilled 9 holes on the MINDY claims (51) for a total of 1 047 m. Tin minerals occur with zinc, tungsten and copper minerals in skarn.

In the Mayo area, the Cortin Joint Venture of Billiton Canada Ltd., Canadian Nickel Co. Ltd. and Campbell Resources Inc. drilled eight holes totalling 1 524 m on the EPD claims (36). Drill intersections exceeding one per cent tin over widths in excess of one m were reported. In addition, geological mapping and soil geochemical sampling programs were conducted on the JOUMBIRA, MAHTIN, SNARK and BANDER claim (35) groups. Geological mapping was also done on the JABBERWOCK claims (38).

Uranium

Uranium exploration was at a low level in 1981. Archer, Cathro and Associates worked on several properties in the Wernecke Mountains, all associated with diatreme breccias in Helikian sedimentary rocks. They include the BOND (63), FACE (61), PIKE (61) and PTERD (62) claims. Texaco Canada Resources in joint venture with Zelon Enterprises worked on the HAIL, IOTA, IRON, etc. claims (60) in the Wernecke Mountains where the target for prospecting was uranium associated with breccia diatremes. Northeast of Whitehorse (64), AGIP Canada Ltd. conducted geological, geochemical and geophysical surveys on the GAMMON claims.

Barite

In the MacMillan Pass area, Yukon Barite Company Limited drilled the TEA barite (85) deposits and bulk sampled outcrops of barite. The company hopes to put the property into production in 1982. The design plant has a capacity of 40 000 t per year and development is estimated to cost approximately \$2 million.

Asbestos

Asbestos exploration was restricted to work conducted by Archer, Cathro and Associates in the Clinton Creek area on the TARTZHART, TOADSTEAK, TATER, TURK, TIZA, and TJOP claims (83). Brinco Mining Ltd. in joint venture with Cominco Ltd. and Exploram explored for asbestos in the Clinton Creek area. Golden Gate Explorations conducted a small drilling program on the REX claims (88) near Haines Junction.

Coal

In late 1981, Sulpetro Minerals Ltd. drilled five holes totalling 718 m in the Rock River area, 120 km northeast of Watson Lake (86). The intersections of sub-bituminous coal and lignite indicated a significant coal deposit which is suitable for thermal generation of electricity.

Mining Production and Development

Metallic mineral production in the Northwest Territories during 1981 was valued at \$456.4 million compared to \$435 million in 1980. Production came from nine mining establishments that produce zinc, lead, tungsten, gold and silver. Lead and zinc production accounted for 73 per cent of production value, while gold accounted for 14 per cent and tungsten 9 per cent. The mines are Canada Tungsten Mining Corporation (tungsten); Camlaren Mines Ltd. (gold); Cominco Ltd.'s Con Mine (gold, silver); Cullaton Lake Gold Mines Ltd. (gold, silver); Echo Bay Mines Ltd. (silver, copper); Giant Yellowknife Mines Ltd. (gold, silver); Nanisivik Mines Ltd. (zinc, lead, silver); Pine Point Mines Ltd. (zinc, lead); and Terra Mining and Exploration Ltd. (silver, copper).

The Northwest Territories accounted for 100 per cent of the tungsten, 23.8 per cent of the lead, 22.5 per cent of the zinc, 7.4 per cent of the gold and 3.1 per cent of the silver produced in Canada. In 1981 the Northwest Territories accounted for 4.9 per cent of Canadian metallic mineral production.

There were 2 085 persons employed by the producing mines or 9.2 per cent of the Northwest Territories' work force.

Mining in the Northwest Territories continued to expand with the start of production from the Cullaton Lake gold mine (h) in October 1981. Four mines are scheduled to commence production in 1982. They are Cominco Ltd.'s Polaris zinc-lead mine (i), and Ptarmigan gold mine (72); Echo Bay Mines Ltd.'s Lupin gold mine (66) and Cadillac Explorations Ltd.'s Prairie Creek silver-lead-zinc mine (103). These developments will more than offset the closing of Echo Bay Mines' silver operation at Port Radium (e) in 1982 and the closing of the short-lived Camlaren gold mine (g) in 1981. In addition lead-zinc production in the Territories will increase about 50 per cent while gold production will nearly double.

The new mine developments are lead by Cominco Ltd.'s Polaris zinc-lead mine on Little Cornwallis Island in the High Arctic. The \$160 million development is expected to produce 187 000 t of zinc concentrate and 42 000 t of lead concentrate a year by the mid-1980s. The mill was turned over in November 1981 and production was expected to commence in January 1982. The performance of the Polaris mine will be watched with great interest, for although isolated by frozen seas, the economics of ocean shipping during a short navigation period from this world-scale deposit offers the prospect of efficient and profitable mining in the High Arctic.

Another major project is the \$128 million Lupin gold mine of Echo Bay Mines Ltd. at Contwoyto Lake (66), 300 km east of Port Radium. Production is expected to start in July 1982. A major airlift of equipment to the property and extensive construction and underground development took place during the year. Initial milling capacity is 900 t a day. Proven and probable reserves estimated at 2.4 million t grading 12 g per t (0.35 oz).

Cadillac Explorations Ltd. is in the pre-production phase of development at its Prairie Creek silver-lead-zinc mine in the Nahanni District (103). The \$40 million project is scheduled for production during the second quarter of 1982. Proven and probable reserves are estimated at 3.4 million t with an average grade of about 260 g (7.5 oz) per t of silver, 12.5 per cent lead, 15 per cent zinc and 0.9 per cent copper.

Cominco Ltd.'s Con Mine is developing the 90 t per day Ptarmigan gold mine near Yellowknife for production in early 1982.

During 1981, Giant Yellowknife Mines Ltd. commenced its \$7.2 million underground exploration program on its Salmita gold property on Mackay Lake (69), 225 km northeast of Yellowknife. The company intends to confirm indicated reserves of 135 000 t containing an average of 21.66 g per t of gold. The program includes establishing a decline 100 m below surface and opening the gold-bearing zone on two levels and drilling from underground locations. Camp construction and extension to the airstrip were completed in 1981.



MINERAL EXPLORATION AND MINING NORTHWEST TERRITORIES - 1981

MAP-2

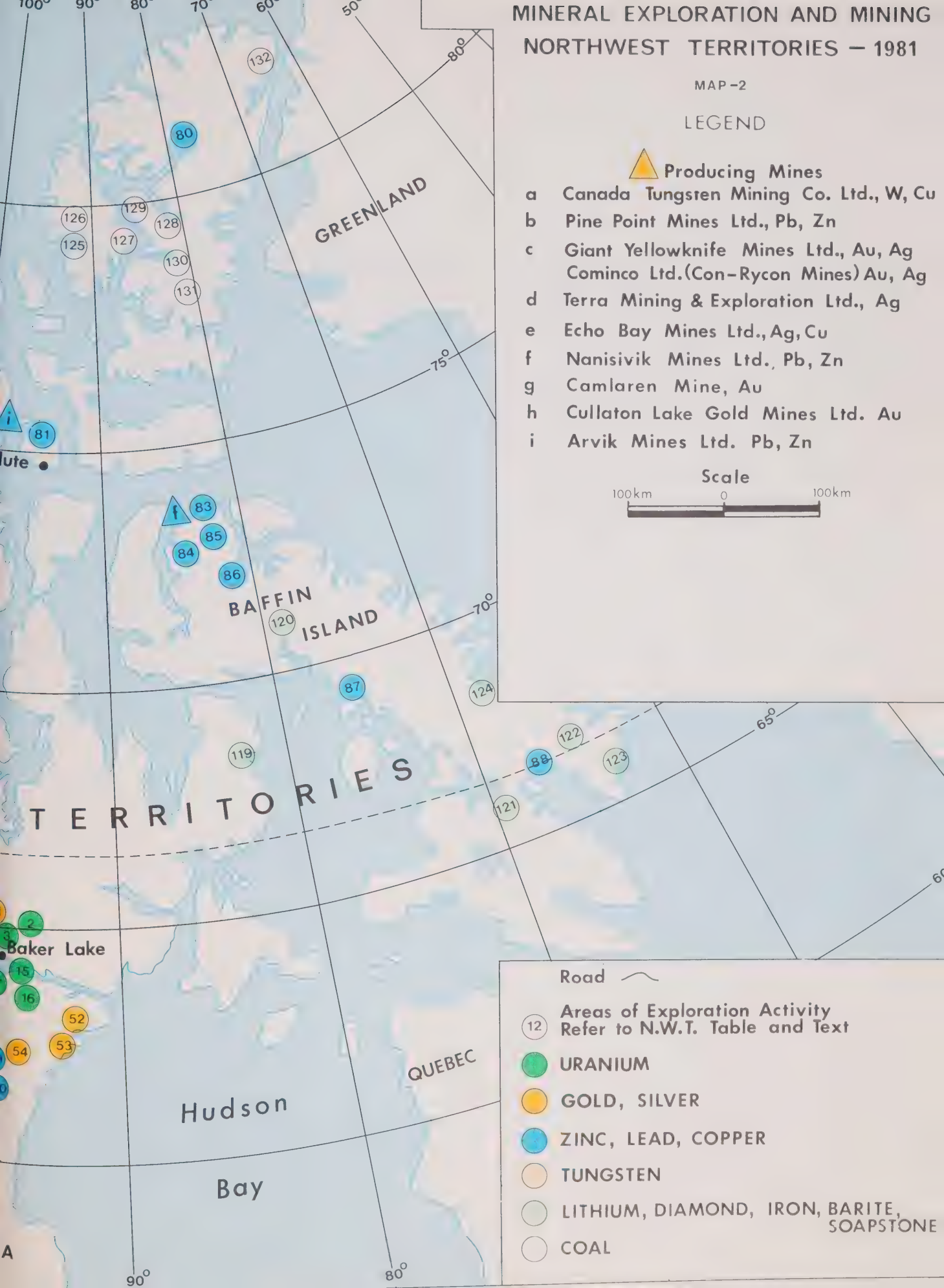
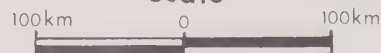
LEGEND



Producing Mines

- a Canada Tungsten Mining Co. Ltd., W, Cu
- b Pine Point Mines Ltd., Pb, Zn
- c Giant Yellowknife Mines Ltd., Au, Ag
Cominco Ltd.(Con-Rycon Mines) Au, Ag
- d Terra Mining & Exploration Ltd., Ag
- e Echo Bay Mines Ltd., Ag, Cu
- f Nanisivik Mines Ltd., Pb, Zn
- g Camlaren Mine, Au
- h Cullaton Lake Gold Mines Ltd. Au
- i Arvik Mines Ltd. Pb, Zn

Scale



Road

12 Areas of Exploration Activity
Refer to N.W.T. Table and Text

- URANIUM
- GOLD, SILVER
- ZINC, LEAD, COPPER
- TUNGSTEN
- LITHIUM, DIAMOND, IRON, BARITE, SOAPSTONE
- COAL

Noranda Mines Limited

In 1980 Noranda Mines Limited and its subsidiary Pamour Porcupine Mines Limited reopened the Camlaren gold property on Muir Island, Gordon Lake (g). The property was leased from Discovery Mines Ltd. and Camlaren Mines Ltd. The 135 t per day mine and mill operation was closed in October 1981 because of poor metal prices. During the year the mill processed 35 950 t of ore to produce a concentrate containing 515.2 kg (16 024 oz) of gold and 127.4 kg (3 964 oz) of silver.

Type:	Underground
Location:	100 km northeast of Yellowknife
Product:	Gold, silver
Mill Rate:	143 t per day
Tonnes Milled:	39 950 t
Reserves:	Nil
Employees:	51

Canada Tungsten Mining Corporation

Canada Tungsten Mining Corporation's Cantung Mine (a) milled 214 633 t of ore to produce 2 155 180 kg of WO₃ in 1981, a decrease of 54 per cent from 1980. The production decline resulted from a labour strike which extended from November 14, 1980 to May 14, 1981. The company was able to supply its customers until February 4, 1981 but had to declare "force majeure" on further deliveries when supplies were depleted. Operations returned to normal in mid-June.

Type:	Underground
Location:	Tungsten
Product:	Tungsten in scheelite concentrate
Mill Rate:	768 t per day
Tonnes Milled:	214 633
Reserves:	3 220 000 t (Dec. 31, 1981)
Reserve Grade:	1.50 % tungsten trioxide (WO ₃)
Employees:	229

Cominco Limited — Con Mine

Cominco Ltd.'s Con Mine (c) milled 176 085 t of ore to produce 2 326 kg of gold and 465 kg of silver. The mine lost about one and a half months production because of a strike.

Type:	Underground
Location:	2.4 km south of Yellowknife
Product:	Gold, silver
Mill Rate:	494 t per day
Tonnes Milled:	176 085
Reserves:	1 900 000 t (Dec. 31, 1981)
Reserve Grade:	16.8 g gold per t
Employees:	350

Cullaton Lake Gold Mines Limited

Cullaton Lake Gold Mines' \$26.5 million joint venture mine controlled by Consolidated Durham Mines and Resources Limited and O'Brien Energy and Resources Limited commenced production in the Cullaton Lake area (h) in November 1981. The mine is located 402 km northwest of Churchill, Manitoba. A major airlift of equipment to the property and extensive construction and underground development took place during the year. The "B" Zone ore deposit was developed by driving a spiral ramp to the 122 m vertical horizon and by developing levels and stopes. The 300 t per day mill, following start up in November, processed 8 666 t of ore in 1981 and produced 11.6 kg of gold and 141.5 g of silver.

Type:	Underground
Location:	Cullaton Lake area, Keewatin District
Product:	Gold, silver
Mill Rate:	141 t per day
Tonnes Milled:	8 666
Reserves:	277 603 t (Aug. 1980)
Reserve Grade:	25.0 g per t
Employees:	57



Echo Bay Mines Limited

Echo Bay Mines continued production from the Eldorado, Contact Lake and Edgar No. 1 mines at Port Radium (e). The mill processed 38 333 t of ore to produce 34 935 kg (1 123 201 oz) of silver and 317 t of copper contained in concentrate. The silver mining operations were terminated in December 1981 because of depressed silver prices and near exhaustion of ore reserves, but milling will continue until March 1982.

Type:	Underground
Location:	Port Radium
Product:	Silver, copper
Mill Rate:	109 t per day
Tonnes Milled:	38 333
Reserves:	Nil (Dec. 31, 1981)
Employees:	107

Giant Yellowknife Mines Limited

Giant Yellowknife Mines Ltd. (c) continued to produce ore from its Giant underground and open pit mine, and adjacent Lolor and Supercrest underground mines. Production during 1981 amounted to 1 645.9 kg (53 033 oz) of gold and 211.5 kg (6 800 oz) of silver from 358 233 t of ore milled. The average grade of ore milled decreased from 6.5 g in 1980 to 5.47 g in 1981. Exploration activity within the vicinity of the mine continued with the main effort being near the Supercrest shaft and main production zones. The company completed a surface silo and truck loadout facility for arsenic trioxide during the year and 1 094 t of As_2O_3 was produced from cleaned precipitator off-gases.

Type:	Underground
Location:	2.4 km north of Yellowknife
Product:	Gold, silver, arsenic
Mill Rate:	980 t per day
Tonnes Milled:	358 233
Reserves:	1 095 898 t (Dec. 31, 1981)
Reserve Grade:	8.23 g per t
Employees:	374

Nanisivik Mines Limited

Nanisivik Mines Limited (f) milled 624 275 t of ore in 1981 to produce 67 976 t of zinc contained in 119 592 t of concentrate and 8 234 t of lead contained in 11 056 t of lead concentrate. The zinc concentrate contained an average of 245.3 g per t of silver; the lead concentrate contained 52.8 g per t of silver.

Type:	Underground
Location:	29 km northeast of Arctic Bay, Baffin Island
Product:	Zinc, lead, silver, cadmium
Mill Rate:	1 524 t per day
Tonnes Milled:	624 275
Reserves:	4 539 300 t (Dec. 31, 1981)
Reserve Grade:	4.3% lead, 6.6% zinc
Employees:	192

Pine Point Mines Limited

Pine Point Mines Limited (b) continued to mine from various open pits. The Pine Point mill processed 3 381 500 t of ore during the year, to produce 145 518 t of zinc contained in 248 960 t of zinc concentrate and 60 515 t of lead in 78 428 t of lead concentrate. During 1981 the company located a new ore deposit containing 0.9 million t of 20 per cent combined lead and zinc.

Type:	Open-pit
Location:	Pine Point
Product:	Lead, zinc
Mill Rate:	9 069 t per day
Tonnes Milled:	3 381 500
Reserves:	37.5 million t (Dec. 31, 1981)
Reserve Grade:	1.9 % lead, 5.4% zinc
Employees:	635

Terra Mining and Exploration Limited

Terra Mining and Exploration Limited (d) terminated mine and mill operations at its Silver Bear Mine in February 1981. During the year an underground development program and extensive drilling program at the Silver Bear Mine indicated new ore reserves, while a surface diamond drilling program confirmed the existence of seven silver-bearing veins in the Norex - Smallwood Mine area, 9.7 km from the Silver Bear Mine. The company plans to continue exploration and development and resume mining and milling operations in 1982. In 1981, the mill processed 1 565 t of ore to produce 1 815 kg of silver and 10 590 kg of copper.

Type: Underground

Location: 15 km south of Great Bear Lake,
Camsell River district

Product: Silver, copper

Mill Rate: 138 tonnes a day

Tonnes Milled: 1 565

Reserves: 39 900 t (Dec. 31, 1981)

Reserve Grade: 1 783 g silver per t

Employees: 90

Mineral Exploration

Prospecting permits in the Northwest Territories issued during 1981 declined to 73 from 98 in the previous year. Similarly, mineral claims staked and recorded declined to 1 041 in 1981 from 1 331 in 1980. The distribution of claims recorded by district for both years is as follows:

Districts	1981		1980	
	Claims Recorded	Area (Hectares)	Claims Recorded	Area (Hectares)
Mackenzie	539	282 202	487	306 633
Arctic and Hudson Bay	479	381 515	773	534 552
Nahanni (Cordillera)	23	8 726	71	25 244
Total	1 041	672 442	1 331	866 429

Exploration expenditures in 1981 are estimated at approximately \$50 million. Total surface diamond drilling amounted to more than 175 306 m. Exploration was principally directed to discovery of uranium, gold and base metal deposits. The number of properties explored in 1981 was 214, up from 164 explored in 1980 and 162 in 1979.

Arvik II, the barge mounted mill-concentrator complex built at Trois Rivières, Québec, is shown here on the St. Lawrence River at the start of its voyage to Little Cornwallis Island on July 24, 1981.



Uranium exploration accounted for 84 exploration projects, which were conducted in Proterozoic regions including the Bear Province, the Thelon-Dubawnt-Baker Lake-Amer Lake region, Nonacho basin and East Arm Great Slave Lake fold belt.

Exploration for gold in veins, shear zones and iron formations continued to be concentrated in Slave Province and the Kaminak-Rankin Subprovince. Known gold-bearing quartz veins in Slave Province on the Ptarmigan (72), Salmita (66), Bullmoose Lake/TA (70), Ruth (70), Diversified/Arseno (75), North Inca (75) and Arcadia (64) properties were explored.

Base metal exploration continued at a respectable level in 1981. Additional lead-zinc reserves were found in the Pine Point District (100) where 87 250 m of diamond drilling were completed. Volcanogenic base metal-silver deposits were also the object of exploration in the Kaminak-Rankin volcanic belt (90) and in Slave Province. In Nahanni District, tungsten skarn and shale-hosted lead-zinc targets along the Yukon-Northwest Territories border were the main focus of activity. In the Arctic Islands, the search for Mississippi Valley type lead-zinc deposits continued and companies acquired coal exploration licences on Ellesmere Island and Axel Heiberg Island.

Surface Diamond Drilling in N.W.T.*

	No. of Projects	Total Holes	Total Meters	Projects with more than 20 holes	
				No. of Projects	Meters
Cordilleran (Nahanni District)	7	61	3 561	1	3 082
Pine Point District, Slave Lowland (Interior Plains)	4	1 107	87 250	4	87 250
Arctic Islands	1	29	3 297	1	3 297
Keewatin (Churchill Province)	7	106	14 960	1	7 967
Southeast Mackenzie District (Churchill Province)	3	10	4 478	1	3 144
East Arm Great Slave Lake Subprovince			2		
Bear Province	13	219	32 014	4	29 118
Slave Province	21	210	29 746	3	14 194
TOTAL	58	1 852	175 306	15	148 052

* Data includes drilling reported to October 30, 1981.

A summary of mining exploration activities is given in Table III. The locations of the exploration activities are shown by numbers in Map 2.

Uranium

In the Thelon-Dubawnt-Baker Lake-Amer Lake region, 24 companies were active in uranium exploration. Work included airborne gamma spectrometer, electro-magnetic and magnetic surveys and ground geological, geophysical, geochemical and prospecting surveys.

Urangesellschaft Canada Ltd. explored in detail the main grid on the Lone Gull property (14) and conducted exploration in the Thirty Mile Lake area (18), Nowleye Lake area (22), Sand Lake area and claims west of Baker Lake (4) and south of Schultz Lake (13). Diamond drilling will be undertaken in 1982 on the company's Lone Gull property, on an adjacent property and on the Sand Lake property (10).

West of Yathkyed lake, 8 000 m was drilled to probe uranium showings and geophysical anomalies on the YU 1-36 claims (20). This project is a joint venture of Pan Ocean Oil Ltd., Noranda Exploration Company Ltd. and AGIP Canada Ltd., with Pan Ocean acting as operator. Pan Ocean also worked in the Bissett Lake (16) and Kazan River (17) areas. BP Minerals Ltd. drilled 1 560 m to test anomalies on its leases south of Schultz Lake (5). Marline Oil Corporation drilled approximately 1 000 m on its claims southeast of Aberdeen Lake (13). Uranerz Exploration and Mining Ltd. drilled 700 m on its claims south of Amer Lake (1). Cominco Ltd. explored its claims east of Aberdeen Lake (13) with approximately 1 000 m of diamond drilling.

Other companies which carried out conventional uranium exploration activities include Noranda Exploration Company Ltd. on its claims south east of Bissett Lake (16); Phillips Petroleum on its permits south of Baker Lake (15); Comaplex Resources International Ltd. on its permits west of Forde Lake (18) and south of Judge Sissons Lake (14); AGIP Canada Ltd. on permits held jointly with Noranda Exploration Company Ltd. northwest of Tulemalu Lake (19), north and west of Carruthers Lake (21) and north of Kamilukuak Lake (23); Union Oil Company of Canada Ltd. on its prospecting permits north and west of Tulemalu Lake (19), south of Garry Lakes (7), west of Sand Lake (8) and south of Amer Lake (1); Anaconda Canada Exploration Ltd. on its claims northwest of Marjorie Lake (12); Seru Nucléaire (Canada) Ltée. on permits and claims southwest and northwest of Tehek Lake (2), south of Deep Rose Lake (6) and north of Beverly Lake (12); Eldorado Nuclear Ltd. in the Baker Lake (5) area; Essex Minerals Company at Rumble Lake (5); Westmin Resources Ltd. on its claims and permits north at Aberdeen Lake (10), and extending northeast from the Thelon game sanctuary to Amer Lake (1); Canadian Nickel Company on its claims northeast of Sand Lake (10); Mobile Energy Minerals Ltd. on claims near Sand Lake (8) and west of Schultz Lake (5); and Texasgulf Inc. on its prospecting permits north of Garry Lakes (7) and east of Consul River (9).

In the southwest Thelon Plain, Gulf Canada Resources Ltd. drilled geophysical targets near "L" Lake (27). Urangesellschaft Canada Ltd. (28), Hudson Bay Minerals Ltd. (29), Texasgulf Inc. (25) and Canadian Nickel Co. Ltd. (Canico) (27) explored their permit areas and claims. PNC Explorations (Canada) Ltd. conducted airborne geophysical and reconnaissance geological and geochemical surveys on its permits in the Foster Lake – Croft Lake area (24). Exploration programs to examine recent permit acquisitions were conducted by Seru Nucléaire (Canada) Ltée. southwest of Sid Lake (30), Anaconda Ltd. near Mantic Lake (25), and Union Oil Ltd. near Beaverhill Lake (26) and Gravel Hill Lake (25).

In the Nonacho Lake region, PNC Exploration (Canada) Ltd. drilled over 3 000 m near the south end of Thekulthili Lake (34) and the program will be continued in 1982. Esso Minerals Canada drilled five holes on the CRIS claims (35) near the junction of the Talston and Tethul Rivers.

Other companies which carried out conventional uranium exploration activities in the Nonacho Lake region include Uranerz Exploration and Mining Ltd. in the Powder Lake area (32) and Trigg, Woollett and Associates Ltd. in the Nonacho Lake area (31).

In the East Arm of Great Slave Lake Subprovince, Scurry Rainbow Oil Ltd. drilled a uranium prospect on the PD claims, on the northeast end of Union Island (37) and explored several claim groups from its Basile Bay camp (38). Chevron Standard did geophysical work on the SHUM claims (38). Reconnaissance uranium surveys were conducted by Woodcock Consultants and Minequest (37), Anaconda Canada Exploration Ltd. (39) and Gulf Canada Resources (36) and (39).

In Bear Province, Chevron Standard Ltd. drilled the WOP claims at Deep Lake (50). AGIP Canada Ltd. drilled its Leith Peninsula properties, near Great Bear Lake (49). Esso Resources Canada Ltd. drilled the WD claims on the west end of Dismal Lakes, Coppermine region (46). BP Minerals Limited explored the TIM and RAD claims south of the Dismal Lakes by geophysical surveys and drilled the TIM property (45). BP Minerals in joint venture with Union Carbide Ltd. drilled showings on the PAT claims, south of the Coppermine River (44). Uranerz Exploration and Mining Ltd. drilled on an island in the Asiatic River (43) and on the GL claims (42). Phillips Petroleum Company and Western Hemisphere Ltd. explored their prospecting permits (47), on the Hornby Bay and Dismal Lake Groups.

Eldorado Nuclear Ltd. under agreement with Giant Yellowknife Mines Ltd. explored Giant's property at the southeastern end of the Bathurst Trench (40) by geological mapping and geophysical surveys. Noranda Exploration Ltd. examined an area on the Kent Peninsula (41).

Lead-Zinc-Copper-Silver

In the Pine Point District, Pine Point Mines Ltd. (100) completed approximately 60 000 m of diamond drilling in search for Mississippi Valley type lead-zinc deposits. A new orebody containing about 0.9 million t of 20 percent combined lead and zinc was discovered. Large drilling programs were also conducted by Westmin Resources Ltd. on its Great Slave Reef Project (101) and Cominco Ltd. on its Hay West Project (102).

In the East Arm of Great Slave Lake Subprovince, Giant Yellowknife Mines Ltd. explored for copper in the Maufelly Point area (99) near Fort Reliance.

In Slave Province, Cominco Ltd. drilled the west end of the A-zone massive sulphide deposit on the Bathurst Norsemines property (92) where additional mineralization was encountered. Texasgulf Inc. drilled sulphide deposits near Amoogabooga Lake (94) and targets on ground optioned from Noranda Mines Ltd. in the Olga Lake belt (95). In the Hope Bay volcanic belt, Noranda conducted an airborne EM survey, explored several claim blocks and drilled the COPE-1 claim (62). Noranda Exploration Company Ltd. continued exploration, for copper-bearing breccia pipes in the Mazenod Lake area (97). The company worked on arsenic-copper-cobalt zones carrying erratic gold and silver values on the GAR claims (97).

Scarboro Resources Ltd. used VLF EM and radiometric surveys, to explore its prospecting permit in the Galena Point area (63). Noranda Exploration Company Ltd. explored part of its extensive property on the Mackay Lake – Courageous Lake volcanic belt (96) and claim groups in the James River area (65). Getty Minerals Ltd. conducted a geophysical survey on the BUDD – SMALL claim group near Nodinka Narrows, Mackay Lake (96).

In the Arctic Islands, Trigg, Woollett and Associates Ltd. sampled and surveyed Global Arctic Ltd.'s TR claims near Chris Creek (83), northern Baffin Island. Nanisivik Mines Ltd. conducted regional airborne geophysical drilling near its mine (84). Petro-Canada Exploration Inc. did reconnaissance exploration in the Arctic Islands for base metals, mainly copper, from camps at Koluktoo Bay (86) and Adams River (84), northern Baffin Island, Tanquary Fiord, northwestern Ellesmere Island (80) and Holman Island (82), western Victoria Island.



In Nahanni District, Pan Ocean Limited optioned the VULCAN massive sulphide prospect (105) from Rio Canex. A diamond drilling program is planned for 1982. Logan Mines Ltd. drilled about 600 m on a lead-zinc-silver bearing skarn on the ROY claims (114). Rideau Resources drilled three holes on the LUCKY claims (104). The most significant intersection gave 26.95 per cent zinc, 6.33 per cent lead, 1.81 per cent copper, 224 g per t silver and 0.96 g per t gold over 1.83 m.

In the Keewatin region, Sulpetro Minerals Ltd. carried out group geophysical surveys and drilled seven holes totalling 2 635 m on claims in the Heninga Lake (90) area. An eighth hole, 63 m long, tested an anomaly on the WENDY claims (89) northwest of Carr Lake.

Tungsten

In Nahanni District, Union Carbide Canada Ltd. drilled its LENED tungsten-bearing skarn property with encouraging results (112). Canada Tungsten Mining Corp. drilled to define the extension of its E-Zone, at its Cantung Mine (a). Lorcan Resources carried out EM surveys and geological mapping on the KEN claims adjacent to Amax's Mactung deposit (111). Chip samples from an outcrop averaged 0.23 percent WO_3 .

Silver

In Bear Province, Terra Mining and Exploration Ltd. (d) and Echo Bay Mines (e) Ltd. conducted underground and surface drilling in search of ore reserves to support their silver mine operations. Terra drilled more than 20 000 m on the Silver Bear Mine property and on the nearby Norex Mine and Smallwood properties. In Slave Province in the Hope Bay volcanic belt near Melville Sound (61), Lynx Canada Explorations Ltd. explored veins of native silver which located intersect pyrite zones by IP surveys and drilling. Extensive staking followed discovery of base metal showings in the area.

The accommodation building
crisp winter day at the Polaris Mine, Little Cornwallis Island.



Gold

In Slave Province, Giant Yellowknife Mines Ltd. conducted exploration and drilled 16 347 m at its Giant, Lolor and Supercrest Mines operation at Yellowknife (c). Outside of Yellowknife, Giant drilled auriferous quartz veins on the AP claims (71) at Myrt Lake, and gold-bearing meta-iron formation on the ALLGOOD claims (67) at Regan Lake, 440 km northeast of Yellowknife. Giant encountered some encouragement at Regan Lake, where seven diamond drill holes returned gold assays of up to 20.33 g per t. The company also conducted underground exploration work in the Salmita property on Mackay Lake (69) and drilled on the TREE-TESS group (76) on the Point Lake-Itchen Lake volcanic belt. Cominco Ltd. continued underground definition and exploratory drilling at its Con Mine (C). Cadillac Explorations Ltd. completed roughly 2 000 m of drilling on a gold prospect in the Gordon Lake area (71). Echo Bay Mines Ltd. continued underground drilling at its Lupin Mine, at Contwoyto Lake (66) and drilled the MAY claim (71) at Gordon Lake. Canadian Superior Explorations Ltd. drilled the FIN claims southeast of Echo Bay Mines' Lupin property (66). Terra Mining and Exploration drilled on the TA-DS claim group at Bullmoose Lake (70). Consolidated Five Star Resources explored a prospect at the southern end of Prosperous Lake near Yellowknife (72) by rotary drilling. Ashnola Mines Ltd. explored its Johnson Lake property (72) where the company drove a 49 m decline with 59 m of cross-cutting and drifting to bulk sample a showing. Newmont Exploration drilled near the Discovery Mine in the Giauque Lake area (73) following surface exploration. Noranda Exploration Ltd. explored ground in the same area. Canuc Resources Inc. drilled over 4 000 m on the gold property of Arcadia Explorations Ltd. at Gray's Bay (64) on Coronation Gulf. Lynx Canada Explorations Ltd. drilled its Ida Point gold prospect north of the Roberts Lake silver prospect (61). Roxwell Gold Mines Ltd. drilled a property south of the Tundra Mine (69). Burnt Island Gold Mines drilled a prospect on the GOO claims (71) on an island in Gordon Lake, north of the Camlaren Mine. Gold-bearing zones are indicated on two neighbouring islands.

In the Keewatin District, Esso Minerals Ltd. investigated the precious and base metal potential of Kaminak Group volcanics outcropping north, east and west of Henik Lake (56). A number of areas were staked and explored by detailed mapping, frost boil sampling and EM and magnetometer surveys. Arctic Engineering Services investigated the gold and base metal potential of claims held by Consolidated Five Star Resources Ltd. in the Rankin Inlet area (52). Inco Metals Ltd. searched for base and precious metals in the Rankin Inlet area and staked claims on Pork Peninsula (53) south of Rankin Inlet. Chevron Standard prospected the Kaminak Group volcanics and sediments in the Kaminak Lake area (54). Pan Ocean Oil Ltd. explored for precious metals in the greenstone belts south of Yathkyed Lake (55). W.G. Wahl explored on five prospecting permits held by Kognak Gold Explorations Ltd., northeast of Otter Lake (57). Suncor Ltd. prospected and conducted geochemical surveys in two basins of Aphebian metasediments in the Watterson Lake (59) and Hawk Hill – Mountain Lakes areas (58). Giant Yellowknife Mines Ltd. investigated gold showings and staked claims in the Ennadai Lake area (60). Essex Mineral explored for precious metals on its prospecting permit north of Baker Lake (51).

Tantalum-Columbium

Tantalum Mining Corporation (Tanco) explored pegmatites in the Southern Slave Province (116) southeast of Yellowknife for tantalum. A consultant for Hemisphere Development Corporation investigated tantalum-bearing pegmatites near the shore of Great Slave Lake (117) southeast of Yellowknife. Placer Development Ltd. completed its third drill program on the THOR claims (117), east of Yellowknife, optioned from Highwood Resources Ltd. A Highwood annual report states that 63.5 million t is indicated grading 0.3 kg of tantalum oxide and 4.0 kg of columbium oxide per t. Placer Development is continuing to carry out beneficiation tests to develop an efficient extraction system.

Lithium

Amhawk Resource Corp. announced geological reserves of 2 million t of 1.12 per cent lithia (Li_2O) on its JAKE property (116) based on the 1981 exploration program.

Barite

In the East Arm of Great Slave Lake Subprovince, Mountain Minerals Ltd. examined a barite deposit near Snowdrift (118) and a prospector from Snowdrift, Mr. Lloyd Anderson, staked another barite showing (118).

Diamonds

Diapros continued to explore for diamonds on the Blackwater River permits (115) by boulder trail mapping, geophysics, geochemistry and drilling.

Iron

Borealis Exploration Ltd. sampled and conducted environmental studies on its magnetite deposits near Roche Bay, Melville Peninsula (119).

Coal

In the Arctic Islands interest in coal resources was expressed by preliminary exploration and acquisition of coal licences. Following reconnaissance surveys, Utah Mines Ltd. was granted 11 coal licences on Axel Heiberg Island (127) and Ellesmere Island (130). Gulf Canada Resources was granted 23 coal licences near Eureka, western Ellesmere Island (129) and west-central Axel Heiberg Island (127). Petro-Canada Exploration Inc. explored an area covered by 133 new coal licences between Eureka (128) and Vendom Fiord (131) on west-central Ellesmere Island and four new coal licences near Fort Conger (132), northeastern Ellesmere Island. Mr. D. McKinnon examined coal seams at Fort Conger and near Lake Hazen (132), northeastern Ellesmere Island and applied for four coal leases.

In the Coal Mine Lake area (134) west of the Mackenzie Delta, Petro-Canada Exploration and Gulf Canada Resources were both granted one coal exploration licence.

Mineral Production Chart – 1972-1981 Table 1
Production des Minéraux – 1972-1981 Tableau 1

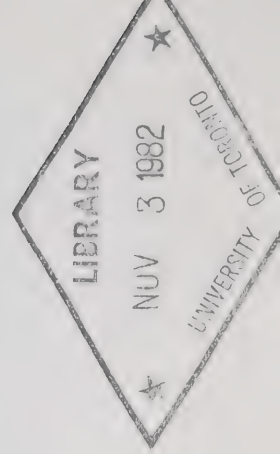
ERRATA

Northwest Territories — Territoires du Nord-Ouest

Mineral	1972	1973	1974	1975	1976	1977	1978	1979	1980(R)	1981(P)
Gold – Or g – gr	17 713 250 9 563 666	24 262 894 7 747 098	28 651 414 5 737 565	28 754 047 5 460 651	24 390 081 6 162 252	31 336 428 6 204 583	45 769 718 6 458 948	61 868 488 5 355 926	96 920 000 4 209 000	64 894 000 3 663 000
Silver – Argent g – gr	6 778 965 126 257 130	13 961 789 168 591 544	17 669 851 118 728 409	8 883 385 61 319 168	14 343 774 103 794 822	18 716 934 118 325 557	23 854 173 120 237 000	34 770 651 83 358 000	41 331 000 53 000 000	14 956 000 37 000 000
Copper – Cuivre kg – kg	577 416 514 268	1 106 319 786 610	840 719 491 923	526 889 374 885	639 980 424 469	445 850 291 959	518 993 315 624	941 732 397 191	679 000 262 000	656 000 294 000
Lead – Plomb kg – kg	27 838 277 81 846 189	32 261 787 90 667 291	34 932 761 76 524 844	37 254 292 83 390 558	26 440 157 52 942 453	40 833 313 58 832 599	56 898 673 70 088 814	80 117 935 60 645 969	55 853 000 51 337 000	63 885 000 65 076 000
Zinc – Zinc kg – kg	64 792 006 154 103 925	87 541 226 164 449 732	132 251 480 171 886 138	106 650 304 129 002 037	122 438 035 147 610 457	125 104 245 159 709 355	143 911 352 187 809 913	205 600 051 213 323 454	172 556 000 175 685 000	269 047 000 224 206 000
Uranium – Uranium kg – kg										250
Cadmium – Cadmium kg – kg	205 436 36 832	61 152 7 620		1 027 137	3 179 549	2 677 386				
Bismuth – Bismuth kg – kg										
Tungsten – Tungstène kg – kg	1 439 757	1 464 468	1 613 700	1 477 731	2 158 154	2 284 409	2 885 619	53 675 858 3 254 067	68 119 000 4 007 000	42 580 000 2 490 000
Arsenic Trioxide kg										370 000 1 093 176
TOTAL	117 905 350	159 195 167	214 346 225	182 069 944	188 255 206	216 439 447	270 952 909	436 974 715	435 458 000	456 388 000

Source: Mineral Policy Sector, Energy, Mines and Resources and Northern Non-renewable Resources, Indian Affairs and Northern Development.

(P) Preliminary Figures, (R) Revised Figures



Mineral Production Chart – 1972-1981 Table I
Production des Minéraux – 1972-1981 Tableau I

Yukon Territory
Yukon

Mineral	1972	1973	1974	1975	1976	1977	1978	1979	1980(R)	1981(P)
Gold – Or g – gr	234 983 126 871	2 032 502 648 974	4 111 631 823 371	5 255 077 997 986	4 401 075 1 111 949	4 656 118 921 907	8 518 731 1 202 149	13 749 271 1 190 268	63 029 000 2 982 000	63 725 000 3 596 000
Silver – Argent g – gr	8 331 575 155 174 219	15 342 856 188 921 678	26 800 905 180 082 381	28 531 397 196 943 109	12 809 321 92 697 630	20 154 760 127 415 268	28 462 559 143 459 000	54 218 064 129 982 000	114 120 000 147 000 000	69 528 000 172 000 000
Lead – Plomb kg – kg	34 392 366 101 115 601	38 013 324 106 831 187	41 194 600 90 242 227	54 888 680 122 863 633	15 999 040 32 035 681	47 627 667 68 621 899	64 322 403 79 233 298	103 374 279 78 250 062	71 558 000 65 771 000	50 706 000 51 651 000
Copper – Cuivre kg – kg	890 286 792 922	14 791 665 10 517 104	15 571 426 9 111 183	11 928 559 8 487 245	16 045 963 10 642 540	8 953 814 5 843 210	16 474 354 10 018 826	18 442 058 7 778 231	27 082 000 10 433 000	20 192 000 9 129 000
Coal – Charbon tonnes – tonnes	16 724	17 782	15 447	23 326	9 046	18 779	16 578	23 003	16 529	20 860
Zinc – Zinc kg – kg	45 341 287 107 603 704	61 167 027 114 904 734	60 899 995 79 151 212	95 400 540 115 394 553	39 233 926 47 300 153	80 562 287 102 846 637	74 076 827 96 673 141	109 450 866 113 572 783	88 313 000 90 938 000	103 783 000 86 486 000
Cadmium – Cadmium kg – kg	82 759 14 837	45 718 5 697	17 331 1 977	15 423 2 050	13 220 2 284	11 595 1 670	355 58			
Asbestos – Amiante tonnes – tonnes	13 006 476 92 431	13 915 140 91 384	22 752 400 82 459	32 820 720 103 735	35 310 723 103 431	47 493 872 95 590	26 948 800 53 255			
Nickel – Nickel kg – kg	3 996 762 1 276 691	5 209 621 1 544 473								
Platinum – Platine g – gr	325 573 112 750	149 458 40 870								
TOTAL	106 602 067	150 667 311	171 348 288	228 840 396	123 813 268	209 460 113	218 804 029	299 244 538	364 102 000	307 934 000

Source: Secteur des politiques minières, Énergie, Mines et Ressources et Ressources non renouvelables du Nord, Affaires indiennes et du Nord Canada
(P) chiffres provisoires (R) chiffres révisés

Mineral Production Chart – 1972-1981 Table I
Production des Minéraux – 1972-1981 Tableau I

Yukon Territory Yukon		1972	1973	1974	1975	1976	1977	1978	1979	1980(R)	1981(P)
Mineral Minéraux											
Gold – Or g – (gr)	\$	234 983 126 871	2 032 502 648 974	4 111 631 823 371	5 255 077 997 986	4 401 075 1 111 949	4 656 118 921 907	45 769 718 6 458 948	61 868 488 5 355 926	96 920 000 4 209 000	64 894 000 3 663 000
Silver – Argent g – (gr)	\$	8 331 575 155 174 219	15 342 856 188 921 678	26 800 905 180 082 381	28 531 397 196 943 109	12 809 321 92 697 630	20 154 760 127 415 268	23 854 173 120 237 000	34 770 651 83 358 000	41 331 000 53 000 000	14 956 000 37 000 000
Lead – Plomb kg – (kg)	\$	34 392 366 101 115 601	38 013 324 106 831 187	41 194 600 90 242 227	54 888 680 122 863 633	15 999 040 32 035 681	47 627 667 68 621 899	518 993 315 624	941 732 397 191	679 000 262 000	656 000 294 000
Copper – Cuivre kg – (kg)	\$	890 286 792 922	14 791 665 10 517 104	15 571 426 9 111 183	11 928 559 8 487 245	16 045 963 10 642 540	8 953 814 5 843 210	56 898 673 70 088 814	80 117 935 60 645 969	55 853 000 51 337 000	63 885 000 65 076 000
Coal – Charbon tonnes -	\$	16 724	17 782	15 447	23 326	9 046	18 779	143 911 352 187 809 913	205 600 051 213 323 454	172 556 000 175 685 000	269 047 000 224 206 000
Zinc – Zinc kg – (kg)	\$	45 341 287 107 603 704	61 167 027 114 904 734	60 899 995 79 151 212	95 400 540 115 394 553	39 233 926 47 300 153	80 562 287 102 846 637	250			
Cadmium - Cadmium kg – (kg)	\$	82 759 14 837	45 718 5 697	17 331 1 977	15 423 2 050	13 220 2 284	11 595 1 670				
Asbestos – Amiante tonnes -	\$	13 006 476 92 431	13 915 140 91 384	22 752 400 82 459	32 820 720 103 735	35 310 723 103 431	47 493 872 95 590				
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Platinum – Platine g – (gr)	\$	325 573 112 750	149 458 40 870								370 000 1 093 176
Total	\$	106 502 067	150 667 311	171 348 288	228 840 396	123 813 268	209 460 113	270 952 909	436 974 715	435 458 000	456 382 000

Source: Mineral Policy Sector, Energy, Mines and Resources and Northern Non-renewable Resources, Indian Affairs and Northern Development.
(P) Preliminary Figures, (R) Revised Figures

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Silver – Argent g – (gr)	\$	6 778 965 126 257 130	13 961 789 168 591 544	17 669 851 118 728 409	8 883 385 61 319 168	14 343 774 103 794 822	18 716 934 118 325 557	28 462 559 143 459 000	54 218 064 129 982 000	114 120 000 147 000 000	69 528 000 172 000 000
Copper – Cuivre kg – (kg)	\$	577 416 514 268	1 106 319 786 610	840 719 491 923	526 889 374 885	639 980 424 469	445 850 291 959	64 322 403 79 233 298	103 374 279 78 250 062	71 558 000 65 771 000	50 706 000 51 651 000
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Uranium – Uranium kg – (kg)	\$										
Cadmium - Cadmium kg – (kg)	\$	205 436 36 832	61 152 7 620		1 027 137	3 179 549	2 677 386	355 58			
Bismuth - Bismuth kg – (kg)	\$							26 948 800 53 255			
Tungsten - Tungstène kg – (kg)	\$	1 439 757	1 464 468	1 613 700	1 477 731	2 158 154	2 284 409				
Arsenic Trioxide kg	\$										
Total	\$	177 905 350	158 925 167	214 346 225	182 069 944	188 254 206	216 439 447	218 804 029	299 244 538	364 102 000	307 934 000

Stage		Activity (in part or total)	Purpose
1	Reconnaissance Exploration	Stream sediment and water sampling; reconnaissance geological mapping and prospecting; airborne geophysical surveys; radiometric, electromagnetic and magnetic; staking.	To locate anomalies. An anomaly is an area of the earth having properties which deviate from normal. A lake having unusual amounts of uranium in the bottom sediments, or rocks with high electrical conductivity are examples of anomalies.
2	Detailed Ground Follow-up	Detailed soil geochemical surveys; radiometric, magnetic, electromagnetic, gravimetric and other geophysical surveys; prospecting for mineralized outcrops; detailed geological mapping.	To confirm the presence of the reconnaissance anomalies before drilling or trenching.
3	Exploratory Drilling and Trenching	Sampling of shallow anomalies by blasting trenches to expose fresh rock; sampling of overburden by shallow drilling; diamond drilling of bedrock to depths of up to several thousand feet; chemical analysis of core samples.	To determine if the mineralized body is of sufficient size and quality to justify the high costs of future development work.
4	Systematic Predevelopment Work and Trenching	Closely spaced diamond drilling; ore-reserve calculations; preliminary mining and metallurgical studies; start environmental studies; preliminary economic evaluation including market studies.	To establish ore reserves, production rate, profitability.
5	Final Feasibility Study	Engineering design of mine, mill and ancillary services; environmental impact assessment; final economic evaluation — financing.	To determine if mine should be brought into production.
6	Mine Development	Establish operating organization; development of underground or open-pit mine; construction of treatment plant and ancillary services; environmental impact assessment; final economic evaluation — financing.	To prepare the mine for production. This stage normally involves contractors and consultants each having expertise in specific areas.
7	Mining and Milling Operation	Mining and milling of the ore and marketing of the product.	Following a tune-up period the new mine normally reaches its rated capacity within the first year. In a joint-venture project each partner is responsible for marketing its share of the product from the operation.

Table II
Exploration – Yukon

Location (1)	Company (2)	Property/ Area (3)	Mineral- ization (4)	Exploration Stages (5)
1	Mattagami	RIKI	Pb, Zn, U	2
2	Anaconda	STYX	Pb, Zn	3
3	Mattagami	DALE	Pb, Zn	2
4	Rio Tinto	CORD	Pb, Zn	3
5	Amax	DOC	Pb, Zn, Ag	3
6	Mattagami	FIONA	Pb, Zn	2
7	Getty/US Steel	Clear L.	Pb, Zn	3*
8	Anaconda	ACE	Pb, Zn	3
9	Cyprus Anvil	ANVIL	Pb, Zn	6
10	Getty	EVA	Pb, Zn	2
11	Cyprus Anvil	TENAS	Pb, Zn	3
12	AGIP	NEVE	Pb, Zn	2
13	Amax	FAN	Pb, Zn	2
14	Cominco	NIDD	Pb, Zn	3
15	Pan Ocean	JASON	Pb, Zn, Ag	3**
15	Amax	MACTUNG	W	5
15	Hudson Bay	TOM	Pb, Zn	5
15	Canadian Nickel	DUO	Pb, Zn	1
16	Placer/US Steel	Howard's Pass	Pb, Zn	4
17	Hudson Bay	Pelly Banks	Pb, Zn	3
18	Cominco	FIN	Pb, Zn	2
19	Cominco	BARB	Pb, Zn, Ag	2
20	Cyprus Anvil	ANMAC	Pb, Zn	1
21	Noranda/Asarco	Quartz L.	Pb, Zn	3
22	Sulpetro	MEL	Pb, Zn, Ba	2
23	Amax	MID	Pb, Zn	2
23	Amax	WOLF	Pb, Zn	3
24	Chevron	BAR	Pb, Ba	1
25	Canadian Nickel	RAM	Pb, Zn, Ag	2
26	Prism	VAL, VERA	Pb, Zn, Ag	4
27	Welcome North/Esperanza	LADY DI	Pb, Zn	1
28	Mattagami	TOUCHE	Zn	2
29	Canadian Occidental	MOX	Pb, Zn, Cu, Ag	2
30	Cominco	MICKEY	Pb, Zn, Ag	3
31	Archer, Cathro	FYIQ	Pb, Zn, Ag	2
32	Serem	LOOTZ	W	2
33	Noranda	RAIL	W	3
34	Cominco	PLUTO	Mo, W	3*
35	Cortin Joint Venture	SNARK	Sn	2
36	Cortin Joint Venture	EPD	Sn	3*
37	Canada Tungsten	Ray Gulch	W	3
38	Cortin Joint Venture	JABBERWOCK	Sn	2
39	Island Mining	WAYNE	W, Au	3
39	Canadian Nickel	RAM	Pb, Zn, Ag	2
40	Dupont	TWO BUTTES	W	3
41	Union Carbide	KALZAS TWINS	W	2
42	AGIP	ICE, FIRE,SUN	Mo, W, Cu	2
43	Placer	CLEA	W	3*
44	Canadian Occidental	HATCH, THATCH	W, Mo	2
45	Hudson Bay	CAB	W	3*
45	Amax	GREW	Pb, Zn	2
46	Union Carbide	RENA	Mo	2
47	Noranda	ROSE	W	3
47	Archer, Cathro	CREAM	W	2
48	Archer, Cathro	SNEET	W	2
48	Archer, Cathro	IVO	W	3
49	Archer, Cathro	SPORK	W	2
50	Amoco/Tintina Silver	Red Mountain	Mo	3**

51	Newmont	MINDY	Sn, Zn	3
52	Serem	STONEAX, SOURCE	W	2
53	Serem	TEAM	W	3
54	Dupont	DU, SWIFT	Sn	3
54	DC Syndicate	SIN	Sn	3
55	Amax	LOGTUNG	W	4
56	Canadian Occidental	GOAT	W, Cu, Zn	2
57	Amax/Pan Ocean/Serem	FIDDLER	W	3
58	Serem	CABIN, URSUS	W	2
59	DC Syndicate	JC	Sn	3*
60	Archer, Cathro	APE	U	2
60	Texaco	IOTA	U	1
61	Archer, Cathro	PIKE	U	2
61	Archer, Cathro	FACE	U	2
62	Archer, Cathro	PTERD	U	3
63	Archer, Cathro	BOND	U	2
64	AGIP	GAMMON	U	2
65	Dawson Eldorado	LONE STAR	Au	2
65	Archer, Cathro	TEFATJV	Au	2
66	Rio Tinto	IDA	Au	3
67	Archer, Cathro	BLENDE	Ag, Pb, Zn	1
68	Rio Tinto	STROKER	Au	2
69	Canada Tungsten	Mount Keno Mine	Ag, Pb	2
69	Canada Tungsten	ZAP	Ag	3
69	Canada Tungsten	IDAHO	Ag	2
69	Turner Energy	Rambler Hill	Ag	2
70	Hudson Bay	Sonora Gulch	Au	3
71	Archer, Cathro	NIT	Au	1
71	Archer, Cathro	LILYPAD	Ag	3
72	Nat Joint Venture	KLAZAN, NITRO	Au	1
73	Noranda	DART	Au	2
73	Arctic Red Resources	FREEGOLD	Au, Ag	3
73	Arctic Red Resources	LAFORMA	Au	2
74	Silver Tusk	TINTA HILL	Au, Ag, Zn	4
75	AGIP	KUKU	Au	2
76	Archer, Cathro	JUBILEE	Au	3
77	United Keno Hill	VENUS	Au, Ag	6
78	Canadian Occidental	LICK	Ag, Pb, Zn	2
79	Cima	Mt. Hundere	Ag, Pb, Zn	3
80	Mattagami	MARN	Cu	3
81	United Keno Hill	STU	Cu	2
82	Esso Minerals	JULIA	Cu, Au	3
83	Archer, Cathro	TJOP	Asbestos	2
84	Milchem	ST. BRIDGET	Ba	1
85	Yukon Barite	TEA	Ba	2
86	Sulpetro	Rock R.	Coal	1
87	Logan	ROMAN	Pb, Zn	2
88	Golden Gate	REX	Asbestos	3
89	BRX	TAWA	Au, Ag, Pb	2
90	B.A. Copper	TOWER	Cu	1
91	Cima	PIKE	Ag, Cu	3
92		Sixty Mile R.	Placer Au	7
93		Hunker Creek	Placer Au	7
93		Klondike	Placer Au	7
94		Sulphur Creek	Placer Au	7
95		Clear Creek	Placer Au	7
96		Burwash Creek	Placer Au	7
97		Livingstone Creek	Placer Au	7

Table III
Exploration – Northwest Territories

Location (1)	Company (2)	Property/ Area (3)	Mineral- ization (4)	Exploration Stages (5)
1	Uranerz	Amer L.	U	3
1	Union Oil	Amer L.	U	2
2	Seru Nucléaire	Tehek L.	U	2
3	Hudson's Bay	Whitehills L.	U	2
4	Urangesellschaft	Baker L.	U	2
5	BP Minerals	Schultz L.	U	3*
5	Eldorado	Rumble L.	U	1
5	Mobil Energy	Schultz L.	U	2
6	Seru Nucléaire	Deep Rose L.	U	2
6	Uranerz	Deep Rose L.	U	1
7	Union Oil	Garry L.	U	2
7	Texasgulf	Garry L.	U	2
7	Uranerz	Garry L.	U	2
8	Union Oil	Sand L.	U	2
8	Mobil Energy	Sand L.	U	1
9	Texasgulf	Consul R.	U	2
10	Westmin	Aberdeen L.	U	2
10	Canadian Nickel	Sand L.	U	2
11	Westmin	Thelon	U	2
12	Anaconda	Marjorie L.	U	2
12	Hudson's Bay	Aberdeen L.	U	2
12	Hudson's Bay	Beverly L.	U	2
13	Urangesellschaft	Schultz L.	U	2
13	Cominco	Aberdeen L.	U	3
13	Marline	Aberdeen L.	U	3
14	Urangesellschaft	LONE GULL	U	2
14	Comaplex	Judge Sissons L.	U	2
15	Phillips Petroleum	Baker L.	U	1
16	Pan Ocean	Bissett L.	U	2
16	Noranda	Bissett L.	U	2
17	Pan Ocean	Kazan R.	U	2
18	Hudson's Bay	Thirty Mile L.	U	2
18	Urangesellschaft	Thirty Mile L.	U	2
18	Comaplex	Forde L.	U	2
19	AGIP/Noranda	Tulemalu L.	U	2
19	Union Oil	Tulemalu L.	U	2
20	Pan Ocean/Noranda	Yathkyed L.	U	3**
21	AGIP/Noranda	Carruthers L.	U	2
22	Urangesellschaft	Nowleye L.	U	2
23	AGIP/Noranda	Kamilukuak L.	U	2
24	PNC Canada	Foster L.	U	2
25	Union Oil	Gravel Hill L.	U	2
25	Anaconda	Mantic L.	U	2
25	Texasgulf	Mosquito L.	U	1
26	PNC Canada	Beaverhill L.	U	2
27	Canadian Nickel	Thelon	U	2
27	Gulf Canada	'L' L.	U	3
28	Urangesellschaft	Eyeberry L.	U	2
29	Urangesellschaft	'925' L.	U	2
29	Hudbay	Dubawnt Basin	U	2
30	Seru Nucléaire	Sid L.	U	2
31	Trigg Woollett	Nonacho L.	U	1

32	Uranerz	Powder L.	U	2
33	PNC Canada	Thekultili L.	U	2
34	PNC Canada	Thekultili L.	U	3**
35	Esso Minerals	CRIS	U	3
36	Gulf Canada	East Arm	U	1
37	Scurry Rainbow	PD (Union Is.)	U	3
37	Minequest	East Arm	U	1
38	Scurry Rainbow	Basile Bay	U	2
38	Chevron	SHUM	U	2
39	Anaconda	East Arm	U	1
39	Gulf Canada	East Arm	U	1
40	Eldorado	Bathurst Trench	U	2
41	Noranda	Kent Pen.	U	2
42	Uranerz	GL, Asiak R.	U	3
43	Uranerz	Asiak R.	U	1
44	BP Minerals/Union Carbide	Coppermine R.	U	3
45	BP Minerals/Alberta Energy	RAD	U	2
45	BP Minerals/Alberta Energy	TIM	U	3
46	Esso Resources	Dismal L.	U	2
46	Esso Resources	WD	U	3
47	Philips Petroleum	Hornby Bay	U	2
48	Esso Resources	Dease Pen.	U	1
49	AGIP	Leith Pen.	U	3
50	Chevron Standard	WOP (Deep L.)	U	3
51	Essex Minerals	Amer L.	Au	1
52	Consolidated Five Star	Rankin Inlet	Au	2
53	Inco Metals	Pork Pen.	Au	2
54	Chevron Standard	Kaminak L.	Au	2
55	Pan Ocean	Yathkyed L.	Au	2
56	Esso Minerals	Yathkyed L.	Au	2
57	Kognak Gold	Yathkyed L.	Au	1
58	Suncor	Hawk Hill L.	Au	1
59	Suncor	Watterson L.	Au	1
60	Giant Yellowknife	Ennadai L.	Au	1
61	Lynx Canada	Hope Bay	Ag	3
62	Noranda	COPE (Hope Bay)	Ag	3
63	Scarboro Resources	Galena Point	Ag, Pb	2
64	Canuc Resources	ARCADIA	Au	3**
65	Noranda	James R.	Ag	2
65	Saskatchewan Mining	High L.	Au	1
66	Echo Bay	LUPIN	Au	6
66	Canadian Superior	FIN	Au	3
67	Giant Yellowknife	ALLGOOD	Au	3
67	Saskatchewan Mining	Regan L.	Au	1
68	Saskatchewan Mining	Back R.	Au	1
69	Giant Yellowknife	SALMITA	Au	4
69	Roxwell	TUNDRA	Au	3
70	Terra	TA-DS	Au	3
71	Giant Yellowknife	Myrt L.	Au	3
71	Echo Bay	MAY (Gordon L.)	Au	4
71	Burnt Island	GOO (Gordon L.)	Au	3
71	Cadillac	Gordon L.	Au	3*

72	Cominco	Negus Point	Au	3
72	Consolidated Five Star	Prosperous L.	Au	3
72	Ashnola	Johnson L.	Au	4
73	Newmont	Giauque L.	Au	3
73	Noranda	Giauque L.	Au	2
74	Noranda	WIJ, INN, EDI	Au	2
75	Paulson	Indin L.	Au	2
76	Giant Yellowknife	TREE-TESS	Au	3
77	Terra	Camsell R.	Ag	3
77	Echo Bay	Contact L.	Ag	3
78	F. Blachut	Blackstone R.	Placer Au	7
79	Turner and Linberg	Liard R.	Placer Au	1
80	Petro-Canada	Tanquery	Cu	1
		Fiord		
81	Cominco	Cornwallis	Pb, Zn	2
		Is.		
83	Trigg Woollett	TR (Chris	Pb, Zn	2
		Creek)		
84	Petro-Canada	Adams R.	Cu, Pb, Zn	1
84	Nanisivik	Nanisivik	Pb, Zn	2
85	Nanisivik	Borden Pen.	Pb, Zn	1
86	Petro-Canada	Koluktoo Bay	Cu, Pb, Zn	1
87	Cominco	Longstaffe	Pb, Zn	2
		Bluff		
88	P. Quappik	Nunatak Is.	Pb, Zn, Mo	1
89	Sulpetro	WENDY (Carr	Cu, Zn	3
		L.)		
90	Sulpetro	Heninga L.	Cu, Zn	3*
91	Texasgulf	Thelon		1
92	Cominco	Hackett R.	Zn, Pb, Cu, Ag	3
93	Noranda	James R.	Pb, Zn	2
94	Texasgulf	Amoogabooga	Cu, Zn, Ag	3
		L.		
95	Texasgulf	Olga L.	Cu, Zn, Ag	3
96	Noranda	MacKay L.		2
97	Noranda	Mazenod L.	Cu	2
97	Noranda	GAR	Cu, Co, Au, Ag	3
98	F. Blachut	Redcliff Is.	Co, Ni, Ag, U	1
99	Giant Yellowknife	Maufelly	Cu	2
		Point		
100	Pine Point	Pine Point	Pb, Zn	3**
101	Pine Point	Pine Point	Pb, Zn	3**
101	Westmin	Pine Point	Pb, Zn	3**
102	Cominco	Hay River	Pb, Zn	3
103	Cadillac	Prairie Creek	Pb, Zn, Ag	6
104	Rideau Resources	LUCKY	Zn, Pb, Cu, Ag, Au	3
105	Pan Ocean	VULCAN	Pb, Zn	2
105	Pan Ocean	BIG RED	Pb, Zn	2
106	Placer/US Steel	Howard's Pass	Zn, Pb	4
107	Noranda	TAN-GRAD		3
108	Noranda	NITE, KEELE	Cu	2
109	Kelvin/Aquitaine	Misty L.		1
110	Canadian Nickel	Mountain R.	Pb, Zn	3
111	Amax	MACTUNG	W	6
111	Lorcan Resources	KEN	W	2
111	Noranda	MacMillan		1
		Pass		
112	Union Carbide	LENED	W	3
113	Union Carbide	Flat R.	W	2
113	C. Turner	Flat R.	W	1

113	Canada Tungsten	BAKER	W	2
114	C. Turner	Flat R.	W	1
114	Logan	ROY	Pb, Zn, Ag	3
115	Diapros	Blackwater R.	Diamonds	3
116	Amhawk	JAKE	Li	4
116	Tantalum Mining	Beaulieu R.	Ta	1
117	Placer	THOR	Ta	3
117	Hemisphere	Beaulieu R.	Ta	1
118	Mountain Minerals	Snowdrift	Ba	2
118	L. Anderson	Snowdrift	Ba	1
119	Borealis	Roche Bay	Fe	2
120	DIAND	Mary R.	Soapstone	1
121	DIAND	Clearwater	Soapstone	1
		Fiord		
122	DIAND	Cape Dyer	Soapstone	1
123	DIAND	Hoare Bay	Soapstone	1
124	DIAND	Nudlung Fiord	Soapstone	1
125	McKinnon & Bradshaw	Strand Fiord	Coal	1
126	Gulf Canada	Axel Heiberg	Coal	1
		Is.		
127	Utah Mines	Axel Heiberg	Coal	1
		Is.		
127	Petro-Canada	Axel Heiberg	Coal	1
		Is.		
127	Gulf Canada	Axel Heiberg	Coal	1
		Is.		
128	Petro-Canada	Eureka	Coal	1
129	Gulf Canada	Eureka	Coal	1
130	Utah Mines	Bay Fiord	Coal	1
131	Petro-Canada	Vendom Fiord	Coal	1
132	McKinnon & Bradshaw	Fort Conger	Coal	1
132	Petro-Canada	Fort Conger	Coal	1
133	Petro-Canada	Banks Is.	Coal	1
134	Petro-Canada	Coal Mine L.	Coal	1
134	Gulf Canada	Coal Mine L.	Coal	1
135	Saskatchewan Mining	Contwoyto L.	Au	1

Footnotes for Tables II and III

- (1) Table location is made with reference to corresponding numbers on Yukon and Northwest Territories Maps. Locations are approximate.
- (2) Abbreviated name of the Company is used: Expl. (Exploration), Ltd. (Limited).
- (3) Geographical areas are indicated by small print, whereas claims and groups are capitalized. Abbreviated words are: Peninsula (Pen), River (R), Lake (L).
- (4) Metal(s) of primary importance defined by chemical symbols: copper (Cu), gold (Au), lead (Pb), Tantalum (Ta), lithium (Li), molybdenum (Mo), silver (Ag), barium (Ba), cobalt (Co), tin (Sn), tungsten (W), and uranium (U); other abbreviations include: placer (pl.), production (pr.).
- (5) Note drilling under Stage 3 in excess of 1400 meters (4600 feet) is denoted by an "*" and that in excess of 3000 meters (9840 feet) by "**".

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